

# The Mining Journal

## RAILWAY AND COMMERCIAL GAZETTE.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 741.—Vol. XIX.]

LONDON, SATURDAY, NOVEMBER 3, 1849.

[PRICE 6D.]

**STAFFORDSHIRE.—IMPORTANT SALE OF IRON-WORKS AND COLLIERIES.**  
**MESSRS. OATES & PERRENS** have been honoured with instructions from the Directors of the Galvanised Iron Company to OFFER FOR SALE, BY PUBLIC AUCTION (unless previously disposed of by private contract, of which due notice will be given), the well-known and valuable COAL and IRON-WORKS, known as the CORBYN'S HALL, DARLSTON GREEN, and TILED HOUSE IRON-WORKS and COLLIERIES, situated at KINGSWINFORD, near Dudley.  
Also, the PHENIX IRON FOUNDRY and WORKS, situated in the same locality.  
Full particulars will be given in a future advertisement.

**GLAMORGANSHIRE, SOUTH WALES.**  
**MR. H. M. PARTRIDGE** will SELL, BY AUCTION, at the Angel Hotel, CARDIFF, on Wednesday, the 7th of November, 1849, at Two o'clock p.m. (unless previously disposed of by private contract, of which due notice will be given):—

Lot 1.—All that well-known COLLIERY, called the DARBEDDUE, situated nearly midway between Merthyr and Cardiff, with all the STOCK and PLANT appertaining thereto, including the inclined plane, which connects it with the Taff Vale Railway.  
This lot is held principally under lease from Sir Charles Morgan, Bart., for a term, of which 18 years are unexpired, and 200 acres of thereto, unworked.

Adjoining this colliery is a large tract of coal, which cannot be advantageously worked through any other opening.

Lot 2.—All that recently-opened COLLIERY, known as the RHONDDA COLLIERY, situated on the side of the Rhondda branch of the Taff Vale Railway, with all the STOCK and PLANT, including a newly-erected HIGH-PRESSURE ENGINE, 30-inch cylinder, 6-foot stroke, and FIVE WORKMEN'S COTTAGES.

The whole of the three veins, or seams, of coal, called the Haved, Cymmar, and Cof-far, celebrated for its quality, so much in repute for making good locomotive engines—are held under lease from Messrs. Edwards and Gelling, for a term, of which 96 years are unexpired.

The Cymmar seam of coal is won by a pit about 35 fms. deep, with an area of 200 acres unworked. The Haved seam underlies the latter about 30 fathoms, with an area of 200 acres, or thereabouts.

Above the Cymmar vein is about 30 inches thick of rich CLAY IRONSTONE, for which there is a ready and profitable sale, even in the present depressed state of the iron trade. The best STEAM COAL SEAMS are here, and may be leased at a low galago; and, from its contiguity to Cardiff, could be supplied at a cheaper rate than any steam coal now worked.

For further particulars, apply to Mr. John Williams, accountant, Newport, Mon. 1; or to Messrs. D. and J. Thomas, mining engineers and surveyors, Postlebridge, near Cardiff, who will show the works and plans.

**MR. GEO. TURTON, STROUD, will SELL, BY AUCTION,** at the Castle Hotel, SWANSEA, on Thursday, the 15th day of November, 1849, at Three o'clock in the afternoon, the

**CEFNETHIR COLLIERY,** situated near CLYDACE. The coal is excellent free-burning coal, and at its steam working, it is worked by level, and a good tramroad runs from the colliery to the Swansea Canal, over which it has to pass less than 5 miles. The colliery is in excellent working condition, and the purchaser can have the PLANT belonging to the same at a valuation, if he desires.

The colliery is held under a lease for 31 years, renewable during the life of the lessor, at a low sleeping rent and royalty.

Also, the POTTERY WHARF, situated in SWANSEA, held under a lease for 99 years, if three lives (one of which only is surviving) should so long live, free from rent. The surviving life in the lease is insured in the sum of £300, the annual premium on which is £10 11s., and the policy will be included in this lot.

For further particulars apply to **RICHARD JENKINS, Solicitor, Swansea.**

**NORTH WALES.—VALUABLE SLATE QUARRIES**  
FOR SALE.—TO BE SOLD, BY PRIVATE CONTRACT, those VALUABLE QUARRIES, called the CAMBRIAN SLATE QUARRIES, situated in the neighbourhood of FEFINIOG, in the county of Merioneth. They have for some time been in full operation, and producing a material of first-rate quality, at a comparatively trifling cost, being in the side of a mountain, water free, and not having more than 10 to 15 feet of lifting. The above property is well worth the attention of capitalists, both from its position and capability of producing, at a slight additional outlay, an almost unlimited quantity of slates.—For particulars apply to

MR. MICHAEL FORSTER, Mining Engineer, Conway, North Wales.  
N.B.—These quarries are sufficiently opened out to develop both the quality of the slates and the capability of the extension of the works.  
Conway, November 1, 1849.

**TO BE DISPOSED OF, THE MANUFACTURING PREMISES, BUSINESS, AND CONNECTION (which is of a first-rate character), of a well-established MACHINERY GREASE MAKER.**

Also, some SHARES in LEAD MINES in NORTH WALES—the remainder being held by most respectable proprietors.

Also, several PATENT RIGHTS, FREEHOLD ESTATES, LEASES OF FOUNDRIES and ENGINEERING WORKS, FREEHOLD QUARRY, and COAL and IRONSTONE MINES; SHARES in a well-known SLATE QUARRY, the PART, or the WHOLE, of a well-established GAS WORK, & STEAM-ENGINES and MACHINERY of all descriptions. For particulars apply to James Boydell, land, mine, and machinery valuer, and agent, No. 54, Threemilestone-street, London.

**TO ENGINEERS, IRON STEAM-SHIP BUILDERS, MANUFACTURERS, & OTHERS.**  
**EXTENSIVE MANUFACTURING PREMISES, TO BE SOLD, OR LET ON LEASE, with or without STEAM-POWER and the VALUABLE MACHINERY.**

The premises are situated at BLACKWALL, having a waterside frontage of about 250 feet, and a good tramroad of 200 tons burthen. The BUILDINGS have mostly been erected within a few years, at a cost of many thousands of pounds; a wharf has been constructed at a great expense; a deep stratum of chalk has also been placed on the bed of the river, to afford additional security to vessels lying alongside; and the position of these premises allows the erection of steam machinery in any vessels moored off the wharf, without the necessity of docking, which can be safely and advantageously effected, from the absence of steam traffic on the river, and consequent disturbance of the water.

The situation is every facility for transit of goods by land and water carriage, and coals can be landed direct from the colliers. The supply of water is unlimited, and free of expense. The East and West India Docks, as also the Terminals of the Blackwall Railway, are immediately adjacent; by means of the latter the Exchange and the public markets may be reached in little more than a quarter of an hour.

The PREMISES have been constructed and arranged for the establishment of an engineer on an extensive scale; but they are equally applicable for any manufacturing business. The total area is 30,000 square feet, and the buildings are lofty, well-lighted, and substantially erected. The MACHINERY (the whole or any part of which may be taken or rejected) is of the best description, by the first makers, and with all the modern improvements, including a highly-finished STEAM-ENGINE and BOILER, seven self-acting, engine-turning, boring, screw-cutting, and surface LATHES; several planing, slotting, drilling, screwing, and shaping MACHINES; eight large grinders; polishing wheels; all the requisite shafting and driving gear; five cutting and punching presses; smiths' forges and tools; cranes, triangles, and every requisite for the business.

The PRINCIPAL FACTORY is fitted with a 25-ton travelling crane, working on an over head tram-way the whole length of the building, on a strong timber double frame, overhanging the river, for the purpose of erecting steam machinery in vessels, loading or unloading heavy weights, and transporting them to any part of the factory.

This ESTABLISHMENT, from situation, extent, arrangement, and construction, together with the many local advantages it possesses, is entitled to rank among the principal in the vicinity of London, and offers a most desirable opportunity to any person desirous of engaging in London in any trade requiring premises, where space, contiguity to the Docks, Exchange, and Markets, the supply of coal and water on most favourable terms, the speedy transit of goods at a low cost, are advantages of importance.

Further particulars, with lithographic plans, and cards to view the property, may be had of Messrs. Fuller and Horsey, 51, Abchurch-lane, London.

**STRUVE'S PATENT MINE VENTILATOR.**  
Coar. 4160.  
TO COLLIER PROPRIETORS.

Quantity of air passed through a Mine almost unlimited, to the extent of 200,000 cubic feet per minute, if necessary—depending on size of apparatus.

COST OF AN APPARATUS to produce a ventilation of 20,000 cubic feet per minute, ONE HUNDRED AND FIFTY POUNDS, exclusive of patent right. This amount of ventilation would be sufficient for a mine working 150 tons per day, provided it was not very dry, in which case it would be desirable to provide an 50,000 cubic feet of air per minute. The capabilities of the Ventilator may be doubled at any future time, at a comparatively small cost.

The Ventilator has been at work for upwards of six months at the Eaglebach Colliery, near Neath, working under a rarefaction of 24 to 3 inches of water, which demonstrates the impossibility of furnace ventilation, when the shafts are shallow and the airways small.—It is practical to vary a mine by this ventilator to the extent of 2 feet of water, or 2 inches of mercury.

LICENSEES will be GRANTED on application to **MR. WILLIAM PRICE STRUVE, Swansea.**  
CIVIL ENGINEER AND MINERAL SURVEYOR.

**TO THE OWNERS OF COLLIERIES, MINES, PLANTATIONS, SAW-MILLS, &c.**  
IMPROVED CIRCULAR SAWS, MILL-SAWS, FILES, Machine Irons, and Cutting Knives, Steel in Billet, Bar, Cast, Sheet, and Drift Steel Springs for Railways and Common Roads, Iron Washers, Bolts, Hammers, &c., on the most PERFECT and ECONOMICAL PRINCIPLES, MANUFACTURED WITH DISPATCH, by **BLAKE AND PARKIN, THE MEADOW STEEL-WORKS, SHEFFIELD.**

**LOANS ON DEBENTURES.—The CALEDONIAN RAILWAY COMPANY** are prepared to RECEIVE TENDERS OF LOANS, in sums not less than £500.—Applications to be made or addressed to this office.

By order, **D. RANKINE, Treasurer.**  
125, George-street, Edinburgh, May 30, 1849.

**CWMBRAIN PATENT IRON REFINERY.—The PROPRIETORS OF IRON FORGES and MILLS** are respectfully INVITED to MAKE TRIAL OF MR. BLEWITT'S REFINED IRON, or METAL, PREPARED BY A NEW PATENT PROCESS.

whereby the IRON is completely FREED from the IMPURITIES CONTRACTED in the BLAST-FURNACE, and, by judicious mixtures, rendered applicable to every kind of manufacture. Heretofore, the metal usually sold in the market has been produced from the worst pigs, scraps, and refuse of some particular blast-furnace, or set of furnaces, without any mixture, or any regard to quality, or the purposes for which it might be required. The PATENT METAL is PREPARED on SYSTEM, and TO ORDER, for any of the following purposes:—

1. For BOILER and TANK-PLATES.
2. For TIN-PLATES, commonly called COKE-PLATES.
3. For STRONG CABLE BOLTS, RIVET, and ANGLE IRON.
4. This COMPACT PUDDLED, beat under the hammer into a bloom, reheated, and rolled into a 6 or 8-inch bar, makes TOPS and BOTTOMS for FLANCH and OTHER RAILS, of every superior quality, and intended for less waste than any other kind of iron used for that purpose. It is also well adapted for rail-roads, horse-shoes, and for other ordinary uses of the blacksmith.

The PATENT METAL is marked with a squirrel, and the initials "R. J. B." and is to be had only at the "Cwmbrain Iron-Works," near Newport, Monmouthshire.

Shortly will be published, in Lithograph,

**A SYNOPSIS OF THE CORNWALL TICKETINGS**  
FOR COPPER ORES, from 1840 to the present time; together with  
A SYNOPSIS OF THE SWANSEA TICKETINGS.

From 1815 to the same period; which contains the following information:—viz. the Standard, Produce, Price, Quantity of Copper Ores Sold, Amount of Money realized, and the Quantity of Fine Copper produced; with respective fluctuations for each year, as well as for every six years; exhibiting also the totals and averages for the whole period collectively.

The above information will be contained on a large sheet of drawing paper, on which the Standard in each year will be delineated by horizontal lines of various colours, pointing to the particulars thereof; the said lines having a scale affixed to them, for the purpose of showing the continued RISE and FALL annually of the STANDARD.

These SYNOPSIS—as is the case with the original—will be "Inscribed, by permission, to JOSEPH THOMAS TREFFAT, Esq., 62 Place, Fovey, the greatest employer of miners and other labourers in the West of England."

The original sheet was exhibited at the recent meeting of the Royal Cornwall Polytechnic Society at Falmouth, where it was regarded with much interest by gentlemen connected with mining and smelting pursuits. The compilation was awarded with a medal, and was thus favourably noticed in the Judge's Report:—"This paper, in the judgment of the committee, contains a very valuable series of deductions from published ticketing papers, very conveniently arranged for reference."

It is proposed to publish the work by subscription, price 7s. 6d., or with rollers, 10s. each, and parties wishing to procure copies will please apply at once to the compiler, **MR. WILLIAM POLKINGHORNE, Fovey Consols, near St. Austell;** or at the office of the Mining Journal, No. 26, Fleet-street, London.

The following is a List of Subscribers already received, with the number of copies where they exceed a single sheet:

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N.B.—Accounts of the aforesaid Synopses, some of which are of a lengthy nature, appeared in the Cornwall Royal Gazette, and West Briton, of 28th Sept.; and West of England Conservative of 4th October; Mining Journal of 6th October; Plymouth and Devonport Journal, &c. &c.

Contract for Coals.

**NOTICE IS HEREBY GIVEN,** that the Administration of the General Post-office in France having POSTPONED the several PERIODS for the DELIVERY OF COALS, advertised to be contracted for on the 19th of October, the changes and alterations in said periods may be ascertained at the office of the Consul-General of France, 47, King William-street, City.

**FOR SALE.—A PORTABLE STEAM-ENGINE,** of 25-horse power, particularly adapted for Driving Machinery in the most economical manner. It is on the principle of Woolf (two cylinders), 4-foot stroke, 24-wheel, 15-foot diameter; fitted in the best possible manner in a strong handsome cast-iron frame, and what is termed a Bright Engine, and now just completed at the manufactory of Messrs. Harvey and Co., of Hayle Foundry, Cornwall, where it may be seen, or further particulars may be obtained on application.

They have also just completed, and FOR SALE, a PUMPING ENGINE, single acting, on the high-pressure expansive principle. The steam cylinder 30-inch diameter 9-foot stroke, made after the most approved manner.  
Hayle Foundry, Oct. 24, 1849.

**ON SALE.—HAMMERED CHARCOAL-BACKBARROW BAR-IRON,** at reduced prices.—Apply to **MATHER, LEDWARD, & CO., Liverpool.**

**WANTED.—A competent FOREMAN OF SMITHS'**—one acquainted with Anchor Making will be preferred. It will be necessary that he should be well versed in all practical forgings, and capable of taking charge of one or more Steam Hammers, and probably from 100 to 200 workmen.—Applications (post-paid) to be addressed to "F. H. and Co., London Works, Birmingham, stating terms, and giving particulars of previous engagements and references."

**MINERAL ENGINEER WANTED:** he must be a good practical man, as he will have to take the entire charge of a going colliery in the north; considerable experience and undeniable character indispensable.—Apply by letter, with full particulars, to Mr. Dicks, agent, 32, Moorgate-street, City.

**A GENTLEMAN, connected with MINING and SMELTING,** wishes to meet with a PARTNER, with the ultimate view of retiring from business, for which satisfactory reasons could be given. To any party with a small capital the above would be worthy of notice.—Address, in the first place (post-paid), to "C. B." office of the Mining Journal, 26, Fleet-street, London.

**TO ENGINEERS, IRONFOUNDERS, and CAPITALISTS.**  
A GENTLEMAN, having secured a PATENT for an important INVENTION connected with IRONWORK and RAILWAYS, wishes to DISPOSE OF THE WHOLE, or PART, of his INTEREST in the same.—The invention can be seen in use to some extent, and full particulars obtained, on application (by letter) to "C. E., care of Mr. Winder, 2, Ingram-court, Fenchurch-street, City.

**TO MINE ADVENTURERS.**—The Undersigned is ready to enter into CONTRACTS for SUPPLY OF COAL, TIMBER, and the various MATERIALS USED IN WORKING MINES in CORNWALL and DEVON, on the lowest terms, and according to such arrangements as may be agreed upon.—Letters addressed as under will be attended to, and prices given.  
THOMAS TREGASKIS, Basset Wharf, Ferman, near Truro.

**WANTED TO PURCHASE.—SHARES in South Frances,** North Roskear, Trelawny, Trehan, South Basset, Devon Great Consols, Treviskey, Tincroft, Bedford, Stray Park and Camborne Vean, East Buller, and Cook's Kitchen Mines.—Apply to Messrs. **WATSON & CUEL,** Mining Offices, 1, St. Michael-alley, Cornhill, London.

N.B.—Messrs. W. & C. are always in a position to treat for the Sale or Purchase of Shares in all the best dividend Mines in Cornwall, Devon, and Wales.

**MINING PROPERTY.—MR. JAMES HERRON, MINE AGENT,** 43, CLEMENTS-LANE, LOMBARD-STREET, has received instructions to DISPOSE OF SHARES in FIRST CLASS MINES, paying regular dividends, and yielding to the purchaser from 17½ to 35 per cent. upon his outlay. He is also in a position to transact business in the following:—viz. Conduffrow, West Providence, Wellington, Treviskey, Tremaine, Wheel Alfred, East Rose, North Roskear, Trelawny, Stray Park, West Caradon, Treligh, Tincroft, Bedford, South Tamar, South Wheel Frances, Alagon, St. John del Rey, and United Mexican Mines.

**MR. C. S. RICHARDSON** wishes to meet with a FEW GENTLEMEN to JOIN him to EXTEND the WORKINGS of a RICH TIN MINE, now paying a profit of above 25 per cent.—Specimens of the finest quality are to be seen at the office, 15, Old Broad-street, with Plans, Reports, &c.—£250 per part, or share, is all that will be required.—MR. R. will provide the additional capital.

**MR. T. A. READWIN, MINING OFFICES,** 2, WINCHESTER-BUILDINGS, OLD BROAD-STREET, LONDON.

**MR. R. TRIPP, MINING AGENT and SHAREBROKER,** BEDFORD CHAMBERS, BAMPFIDE-STREET, EXETER.

**MR. H. B. RYE, has BUSINESS** to transact, both as BUYER and SELLER in all the leading MINES in Cornwall, Devon, and Wales. For particulars, apply at his office, 71, Old Broad-street, City.

**JAMES LANE, MINING SHARE DEALER,** 90, OLD BROAD-STREET, LONDON.

**ASTURIAN MINING COMPANY.—The Board of Directors** and Committee of Liquidation hereby give Notice, that they have made further CALL of TWO POUNDS, or 200 reales vellon, per share upon the shares held in the capital stock of the company, and that such call is PAYABLE for holders of Spanish shares, at the bank of Messrs. H. O'Shea and Co., Madrid; and for all other shares, at the London and County Bank, Lombard-street, London, on the 10th day of November next. That shareholders who shall pay one-half of the said call on or before the said 10th day of November, will be allowed one month for the payment of the other half of the said call: 5 per cent. discount will be allowed on pre-payment.

Offices of the Company, 9, Austin Friars, London; Sept. 28, 1849.  
K. MACKENZIE, Secretary.

**ASTURIAN MINING COMPANY.—IN LIQUIDATION.**  
Notice is hereby given, that the REAL ESTATE, the CONCESSIONS OF MINES, and the WORKS of this COMPANY, at Miras del Camino, Santa Firma, and La Uruña, situated in the Province of OVIEDO and Principality of the ASTURIAS, in SPAIN, have been ordered by the Board of Directors and Liquidators TO BE SOLD, UNDER TENDER, such Tenders also to include the PURCHASE, by VALUATION, in the usual manner, of the STOCK in hand, of all kinds, IMPLEMENTS and ARTICLES used in the various departments of manufacture at the said works. The Tenders to be subject to the approval of a General Meeting of the company, to which is reserved the right of accepting the offer which may appear most beneficial to the shareholders of the said company.

A description of the property, and the conditions of sale, will be ready for inspection at Madrid, with Messrs. H. O'Shea and Co., bankers; at Miras del Camino, with the company's superintendent; at Gijon, with J. Kelly, Esq., British Vice-Consul; and at the company's office in London, on and after the 10th day of November next. All tenders must be sent into the principal office of the company, 9, Austin Friars, London, on or before the 15th day of December next, addressed to "The Directors and Liquidators of the Asturian Mining Company," to whom also should be addressed all enquiries respecting the sale.

The works may be viewed on application to Mr. George Lambley, the superintendent at Miras del Camino, in the Asturias.  
K. MACKENZIE, Secretary.

**CAMBORNE CONSOLS.—CAUTION.**—Sharebrokers and others are hereby reminded, that the THIRD and LAST CALL upon the SHARES in this company was payable on the 25th day of September last; and that, therefore, such of the share certificates which may still be in circulation, without bearing a receipt for the full amount (Seven Pounds) per share, should not be negotiated.

29, Foultry, October 31, 1849.  
H. L. T. VON USTER, Secretary.

**LYNVI IRON COMPANY.**—Notice is hereby given, that a GENERAL MEETING of the shareholders of this company will be HELD at their offices, 15, Old Jewry Chambers, on Friday, the 9th day of November next, at One o'clock precisely.

By order of the board, **F. W. GIBBON, Secretary.**  
London, October 31, 1849.

**DUISBURG IRON-WORKS AND MINES,** IN WESTPHALIA, CLOSE TO THE RHINE.

Managed in England according to the principles of the "Cost-book System," and in Prussia as a Société en Commandite, under laws limiting the liability of the shareholders to their personal subscription.

Company's Office, 28, Moorgate-street, City.

**ASSAYING AND ANALYSIS.**—Mr. MITCHELL begs to inform the MANAGERS, &c., of MINES, SMELTING-WORKS, and MANUFACTORIES, that he still continues to CONDUCT ASSAYS and ANALYSES of all PRODUCTS, metallurgical and manufacturing, at his LABORATORY,

23, HAWLEY-ROAD, KENTISH TOWN, LONDON, to which address communications are to be forwarded.—Instruction in all branches of assaying and analysis as usual.



## SEWERAGE OF LONDON.—THE ATTENTION OF THE COMMISSIONERS APPOINTED TO DETERMINE UPON THE MOST EFFICIENT MATERIAL FOR THE CONSTRUCTION OF THE SEWERS OF LONDON, IS PARTICULARLY DIRECTED TO THE ASPHALTE OF SEYSSAL, WHICH MORE THAN ANY OTHER MATERIAL IS APPLICABLE TO THE CONSTRUCTING AND INTERNAL COATING OF BRICK CULVERTS AND OTHER CHANNELS FOR DRAINAGE.

The experiments made by the Royal Artillery on the embankment of Plymouth Citadel, constructed of Seyssal Asphaltic Brickwork, under the orders of the Hon. Board of Ordnance, have fully proved the superiority, adhesiveness, and strength of Seyssal Asphalt over all other cementitious compositions. A printed account of these experiments can be had on application to  
J. FARRELL, Secretary,  
Seyssal Asphalt Company—"Claridge's Patent"—Established 1838.

**Note.**—The application of the Asphalt of Seyssal is specially recommended by the Commissioners on the Fine Arts for covering the ground line of brickwork in marshy situations, and it has been suggested that it would be peculiarly applicable for covering the areas of closed grave yards, and for the construction of catacombs.

Under the PATRONAGE OF ROYALTY, and the AUTHORITY OF THE FACULTY.

**KEATING'S COUGH LOZENGES.**—Upwards of 40 years' experience has fully confirmed the superior reputation of these LOZENGES, in the cure of Asthma, Winter Cough, Hoarseness, Shortness of Breath, and other pulmonary maladies. They have deservedly obtained the high patronage of their Majesties the King of Prussia, and the King of Hanover; very many also of the Nobility and Clergy, and of the Public generally. Use them, under the recommendation of some of the most eminent of the Faculty. They have immediate influence over the following cases:—Asthmatic and Consumptive Complaints, Coughs, Shortness of Breath, Hoarseness, &c. Prepared and sold in boxes, 1s. 11d., and 2s. 9d., 4s. 6d., and 10s. 6d. each, by Thomas Keating, Chemist, No. 73, St. Paul's Churchyard, London; and retail by all druggists and patent medicine vendors in the kingdom.

**IMPORTANT TESTIMONIAL.**  
Copy of a Letter from Colonel Hosker (the well known Author of "Guns and Shooting")  
Longparish House, near Whitechurch, Hants, October 21, 1848.

Sir,—I cannot resist informing you of the extraordinary effect that I have experienced by taking only a few of your lozenges. I had a cough for several weeks, that defied all that had been prescribed for me, and you have completely rid of it by taking about half a small box of your lozenges, which I find are the only ones that relieve the cough without deranging the stomach or digestive organs.

I am, Sir, your humble servant,  
P. HAWKER.  
To Mr. Keating, 73, St. Paul's Churchyard.

**CHOLERA AND BOWEL COMPLAINTS.**—Thousands have been saved by Dr. MACANN'S GRAND ELIXIR AND TINCTURE. It was successfully prescribed by the late Dr. Macann, when the cholera raged at Bilston, in 1832, and has effected more cures in 1848 than all other medicines. One dose is generally sufficient to stop vomiting, purging, cramp, &c., and every family should have a supply in the house ready. The Grand Elixir is sold in bottles, 2s. 9d. and 11s. each, and the Tincture in bottles, 13d. each, duty included.—Prepared only by THOMAS WHITE, Chemist, Bilston, and sold by him, and by Barclay and Sons, 95, Farringdon-street; Drew, Heyward, and Barron, Bush-lane, Cannon-street; Hanny and Dietrichsen, 63, Oxford-street, London.—Wholesale and shipping agent, Mr. Wm. Bailey, Wolverhampton.—Beware of counterfeit preparations, and see that the Government stamp on each bottle has the signature of "T. WHITE," as none else is genuine.

**EDEN'S FAMILY MEDICINES.**—EDEN'S HOOPING-COUGH MIXTURE has attained universal celebrity as a sure and efficacious remedy for coughs, colds, asthma, influenza, pulmonary consumption, and all affections of the throat, chest, and lungs; a positive cure for hooping-cough, and all diseases to which children are subject.—EDEN'S PILLS are acknowledged by all to be the safest and best medicines in the world for the cure of bilious and nervous complaints, gout, rheumatism, bowel complaints, consumption, and general debility.—EDEN'S OINTMENT, as a cure for scrofula, and all cutaneous eruptions of the skin stands unrivalled.—EDEN'S FAMILY MEDICINES are prepared only, and sold wholesale, by Eden and Co., 2, Jewin Crescent, London, and retail by most respectable chemists and patent medicine vendors in the United Kingdom, in bottles, boxes, and pots, at 1s. 11d., 2s. 9d., and 4s. 6d. each.

**ON NERVOUS DEBILITY AND GENERATIVE DISEASES.**  
Just published, the fourth thousand, an improved edition, revised and corrected, 120 pages, price 2s., in a sealed envelope, or forwarded, post-paid, by the Author, to any address, secure from observation, for 2s. 6d., in postage stamps, illustrated with numerous anatomical coloured engravings, &c.

**MANHOOD: the CAUSES OF ITS PREMATURE DECLINE.**  
With plain directions for its perfect restoration. A Medical Essay on those diseases of the Generative Organs, emanating from solitary and sedentary habits, indiscriminate excesses, the effects of climate, and infection, &c., addressed to the sufferer in youth, manhood, and old age; with practical remarks on marriage, the treatment and cure of nervous and mental debility, impotency, apoplexy, and other urino genital diseases, by which even the most exhausted constitution may be restored, and reach the full period of life allotted to man. The whole illustrated with numerous anatomical engravings on steel, in colour, explaining the various functions, secretions, and structures of the reproductive organs in health and disease; with instructions for private correspondence, cases, &c.—By J. L. CURTIS, consulting surgeon, 15, Abchurch-lane, Piccadilly, London.

**REVIEWS OF THE WORK.**  
We feel no hesitation in saying, that there is no member of society by whom the book will not be found useful—whether such person hold the relation of a parent, preceptor, or a clergyman. *—The Morning Post.*  
J. L. Curtis, *On Manhood, and the Causes of its Premature Decline; with Plain Directions for its Perfect Restoration.* [Strangely, Paternoster-row.]—This is a book replete with valuable advice and information. It develops the fearful shoals on which a large proportion of human happiness is wrecked, and furnishes a chart by which they may be avoided and escaped. Fortunate for a country would it be, did its youth put into practice the philanthropic and scientific maxims here laid down. One cause of matrimonial misery might thus be banished from the land, and the race of the emperors be succeeded by a renewal of the hearty vigorous spirits of the olden time. *—United Kingdom Magazine.*  
Manhood: by J. L. Curtis and Co.—Their long experience and reputation in the treatment of these painful diseases is the patient's guarantee, and well deserves for the work its immense circulation. *—Era.*

**Manhood: a medical work.**—To the gay and thoughtless we trust this little work will serve as a beacon to warn them of the danger attendant upon the too rash indulgence of their passions—whilst to some it may serve as a monitor in the hour of temptation, and to the afflicted as a guide to health. *—Chronicle.*  
Published by the Author, and may be had at his residence; sold also by Strangely, 21, Paternoster-row, London; Heywood, Oldham-street, Manchester; Howell, 16, Church-street, Liverpool; Robinson, 11, Green-side-street, Edinburgh; Campbell, chemist, 144, Argyle-street, Glasgow; Berry and Co., Capel-street, Dublin; and by all booksellers.

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**PART THE FIRST** treats of the anatomy and physiology of the reproductive organs, and is illustrated by six coloured engravings.—**PART THE SECOND** treats of the consequences resulting from excessive indulgence, and their lamentable effects on the system, producing mental and bodily weakness, nervous excitement, and generative incapacity; it is illustrated by three explanatory engravings.—**PART THE THIRD** treats of the diseases resulting from infection either in the primary or secondary form, and contains explicit directions for their treatment. This section is illustrated by 17 coloured engravings.—**PART THE FOURTH** contains a prescription for the prevention of disease by a simple application, by which the danger of infection is obviated. This important part of the work should not escape the reader's notice.—**PART THE FIFTH** is devoted to the consideration of marriage and its duties. The causes of unproductive unions are also considered, and the whole subject critically and philosophically inquired into.

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## Transactions of Scientific Bodies.

### INSTITUTION OF MECHANICAL ENGINEERS.

A general meeting of members, for the reception of papers, and the nomination of officers and council, was held in the Theatre of the Philosophical Institution, Birmingham, on Wednesday week, ROBERT STEPHENSON, Esq., M.P., in the chair. The first paper read was—

#### ON THE ECONOMY OF RAILWAY TRANSIT.

BY MR. JAMES SAMUEL, OF THE EASTERN COUNTIES RAILWAY.

The object of the paper was to show the necessity of working branch lines with lighter and less expensive trains and locomotives than are at present in use, with a view to diminish first cost, consumption of coke, and deterioration of permanent way.

He showed that on many occasions the weight of passengers and luggage bears a proportion to the tonnage employed to convey it as 1 to 26; and to obviate this unnecessary employment of power, and destruction of way, he proposes to construct light locomotives, of about ten tons, which, fixed to a carriage large enough to contain the average number of passengers on a branch line, would form one carriage, there being no tender, and the tank carried under the body of the passengers' carriage. He considered that such an adaptation would also be desirable in express trains on trunk lines, where great speed was demanded, and the weight carried was not great. The paper was illustrated by drawings of the "Enfield" engine, constructed under the direction of Mr. Samuel, and by an elaborate series of calculations and results.

Mr. MC'CONNELL gave much credit to Mr. Samuel for the introduction of this branch traffic carriage. If managers of railways could always calculate the number of passengers to be carried, he (Mr. MC'Connell) could conceive that a great economy might be effected, even under the present system. But this was impossible. How far, under these circumstances, Mr. Samuel's carriage might become useful he was not prepared to say.

The President considered that they were much indebted to Mr. Samuel for his excellent paper, and he regretted that many interested in the economical working of railways had absented themselves from that meeting. The subject of economical transit had, of course, occupied his attention, and he must say that, although he considered the suggestion of Mr. Samuel, so far as certain branch lines were concerned, was entitled to the consideration of all railway companies, yet he (the President) did not agree with Mr. Samuel to the full extent. On small local lines—such as those from London to Greenwich, and London to Blackwall—such carriages would be very valuable in lessening the expense of working, but he could not agree in thinking that for express purposes, or any other, such carriages would or should become popular on main lines. He could not agree with Mr. Samuel, also, with reference to the necessity of fixing the engine to the carriage, for the purpose of giving it steadiness. It appeared to be like rivetting harness to a horse. There was no mechanical necessity for it. He would advise Mr. Samuel not to overstrain his principle by endeavouring to apply to trunk lines what would be manifestly beneficial to branches. The public expected certain comforts in railway travelling, and no system that could be devised would reconcile passengers to be packed together like fish. He (the President) felt that, occupying as he did a position in the management of railways that might give his opinion weight, he had thought it right to say what he had done, lest he might be considered tacitly to admit that which engineers had been doing since 1831 in increasing the weight of engines, had been practically wrong.—The second paper was

#### ON RAILWAY AXLES.

BY MR. J. E. MC'CONNELL.

When the railway system was first introduced into this country, the question of strength of materials for constructing the new stock was (it is to be presumed) materially influenced by the amount of experience derived from the vehicles which had previously been in use for the conveyance of traffic.

As the new system became extended and improved in all its arrangements, and the facilities which it possessed for conveying greater loads at higher speeds were gradually developed, the working stock was necessarily changed from time to time in conformity with the greater demands for convenience and stability. Improvements in almost every point have been carried out, until we have now in operation the railway stock, generally speaking, in an excellent condition for the purpose to which it is applied. It is remarkable that, notwithstanding the importance of proportion and quality as first elements in considering the strength of the materials of which railway moving stock is composed, no rule, generally applicable for even the main features of this great system of machinery, has been established. Without attempting to embrace the whole subject, although one of great importance to proprietors of railways and the public generally, I conceive it is proper, in this place, to express my strong conviction that the general question of the strength and quality of those materials justly proportioned to the strains to which they are subject, and bearing reference to accidents from collision, faults of road, deterioration from a variety of causes, &c., must eventually be treated with great attention and consideration; and, in order to insure safety to life and property for all who use railways, as well as the greatest possible economy for the profit of those who have embarked their capital in their construction, I believe it will be found essential to have some regulations founded upon the joint experience of those parties who have been practically engaged in managing and working the different departments of railways.

It is well known that short-sighted economy has been practised in many instances in giving directions for the purchase and repair of railway stock, and it is only dear-bought experience which can effectually convince those who, to make a little saving by purchasing a cheap, ill-constructed machine, gain a great and constant loss whilst it is in use. The advantages of a general and constant interchange of opinion among those parties to whose judgment and management the working expenses of the different railways are entrusted is most important; and if such varied experience could be collected, regularly and systematically into one focus, where it might be digested and prepared for practical use, the effect for good to the general system of railways would be very great, and, in a scientific point of view, the results recorded would prove highly interesting. Having thus briefly stated a portion of my views as bearing upon the introduction of the best means of producing uniformity in the working stock of railways, I will now proceed to consider "railway axles," which, as an important part of the great machinery, are deserving of marked attention.

I have endeavoured to ascertain whether any data were available which might assist me in forming a groundwork of the results of combined experience on this subject; but I regret to say that, although my inquiries have been in all cases promptly and carefully attended to, yet the object which I had in view has not been attained. As an example of the diversity of opinion, or rather, perhaps, the want of some certain rule to guide engineers in proportioning the strength of axles to their weights and strains, I would refer to different forms of axles now in use on one portion of one railway, and in doing so would remark, that a clearer proof could not be afforded of the desirableness of having some defined principle to guide us in deciding on the strength for railway axles. For obvious reasons I wish particularly to guard against expressing, directly or by inference, any opinion on any description of manufacture of axle, or even quality of iron of which axles are composed. I would wish to limit the scope of the present paper simply to the question of form and dimensions of axle, with the changes and deterioration to which they are subject in process of working, assuming, in all cases, the material of which the axle is made, and the mode of manufacture, to be of the most approved description.

In order to arrive at a knowledge of the best form and dimensions of axles, we have first to ascertain the load and friction to which they are to be exposed; and, secondly, to estimate, as nearly as possible, the strains to which they will be subject whilst in motion. Supposing a wagon or carriage to be constantly in a state of rest, it would, of course, then only be necessary to consider the axle as a beam or girder, sustaining a load of five tons upon the two journals, the points of support being the wheels resting upon the rails, the middle portion of the axle being of sufficient strength to sustain the wheel or prop in its perpendicular position. We then require to find out the proportionate strength, so that each section of this beam or girder shall only be sufficiently strong to resist the strain or load to which it is then subject.

It is ascertained, by an approximate calculation, that a journal of 1.128 inch diameter is not capable of sustaining a heavier load, when in a state of rest, than 23 tons, or 5000 lbs.; and allowing, in practice, that the wagon or carriage axle is made ten times the breaking strength, the diameter of the journal would be, adopting the same calculation, 2.43 inches. In these calculations the strength alone is considered, but we have also to take into account the question of friction, and likewise the tendency to abrasion. With our present means of information no accurate data are available for

determining the best proportion of journal or bearing according to the weight it has to bear, or the velocity at which it is required to move. A great variety of proportion is in use, but it is fair to note that in engine-axles particularly the length of bearing, depends, to a certain extent, upon the construction and arrangement of the engine; as a general rule the length of the bearing is not in due proportion, according to our general experience, to the diameter.

It has always been considered that having first ascertained, from example and experience, the strength of sectional area necessary, under every circumstance, to sustain the load which the journal has to carry, the length of it was determined by the velocity or amount of friction to which it is liable. Judging from axles at present in use in carriages and waggon, the length of bearing is twice the diameter of the journal; but on this, as well as other points on strength of material, there exists a great variety of opinion. Even the forms of journals are found to differ very much. Without attempting to decide on the merits of any of them, I shall in the present instance content myself with stating, that all my experience has proved the desirableness of maintaining rubbing or wearing surfaces of bearings as free as possible from sharp abrupt corners, sudden alterations in diameter, or sectional strength. Having thus treated the journals as regards the load and the friction upon them, I now proceed to estimate the various strains to which the axle is exposed whilst in motion.

The first strain to which the axle is subject is that arising from the weight of the wagon and load, which being received or resting on the journal, produces the greatest effect upon the axle at the outer face of the wheel-boss, and to which is to be added the momentum of the load in falling through spaces caused by inequalities or joints of rails. The injurious consequences of inequalities on the road, surface, and flat places on the surface of the wheel-tyre upon the axle, by the jolting or perpendicular motion which they produce, cannot be accurately estimated, and these are very much increased when the bearing springs of the wagon or carriage are not sufficiently elastic, and do not yield to the shock or blow downwards, so as (to use the expression) to cushion its effect. As an instance of the imperfect action of the springs, I would allude to those in use on many waggon, in which the form and construction cause them to be so rigid that the downward blow is more like a hammer upon an anvil. To obviate this strain as much as possible, it is necessary to proportion the spring so as to sustain the load properly, and yet to be of sufficient elasticity to absorb the effect of the load oscillation. The strain arising from the oscillation of the wagon on curves from imperfect coupling, and increased by the lateral freedom or space on the bearings or play between the rails and flanges of the wheels which, when an irregularity occurs on the side of the rail, or any sudden cause disturbs the direct motion of the wagon onwards, is in effect the same as a blow upon the flange of the wheel, the radius of the wheel tending to act as a lever to break the axle at the inner face of the boss of the wheel. This strain is in the compound ratio of the momentum of the load, the angle at which the wheel strikes the rail, and the distance from the centre of the axle to the point of impact, producing an effective strain upon the axle at the inner face of the wheel boss, which extends proportionately over the whole axle between the wheels. To lessen in practice as much as possible the deteriorating effect of these descriptions of strains upon the axle, the following conditions are important:—

That the bearings or journals of the axle fit as closely to the brasses as is consistent with freedom, the allowance of flange gauge of wheel being quite sufficient for the carriage to move freely round curves and meet any irregularity in the gauge of the rails. That the waggon or carriage be as equally loaded as possible, and the draw chains be exactly in the centre; and as side chains are dangerous, they should be completely removed, provision being made for a duplicate centre draw chain should a failure take place. As the damage to the loading of waggon is in proportion to the oscillation, they should all be secured together by means of screw couplings, having spring buffers upon both ends of every wagon. It is well known that the injury to the wagon, to the load which it conveys, to the axle which carries it, and to the road over which it runs, is very much aggravated if the waggon are allowed to oscillate from side to side, and become like so many battering rams, injuring themselves and all substances in contact with them. A train of waggon or carriages should be joined together similar to the vertebrae of an animal, by which means any sudden lateral action would be neutralised by the support derived from the neighbouring vehicle. The road to be kept as accurate as possible to gauge and line. The third class of strains to which axles are liable are the shocks produced by starting and stopping a train, and which are in proportion to the momentum of the wheel and axle at the time of collision when stopping, and to the velocity of the impelling force and the inertia of the wheel and axle when starting; these strains are felt principally on the neck of the journal. Fourth strain, the torsion or twisting produced owing to wheels travelling over curves of the line; the difference in length of surface of the inner and outer rail compels the one wheel to grind or slide upon the rail, while the other is free to roll. This strain is proportionate to the load on the wheel, determining the amount of friction upon the rail, and the length of axle between the wheels; a slight amount of torsion is also produced from any variation in the diameter of the wheels on the same axle, by any inequality of load upon each journal, the quality of the brasses, or the amount of lubrication proportionately; and the strain of the break block on one side, because when any of these occur separately or jointly, one-half of the extra strain on one journal is transmitted through the axle to the other, and twisting or weakening the axle is necessarily produced. To lessen the amount of the above strain, it is obvious that the wheels should be kept in the best possible state of repair, so far as equal diameters and true circular surfaces are concerned, the waggon or carriage should be loaded equally on each side, the journals carefully lubricated, and all break blocks to bear the same pressure on both wheels of the same axle. Fifth strain, the constant vibration of the whole axle. This is more particularly the case, and is accelerated when the axle is fixed in a rigid, unyielding wheel. My experience has proved that the axles fixed in cast-iron wheels are very much more liable to deterioration than those in wrought-iron wheels, and the jar or vibration tending to deteriorate the quality of the iron, by altering its texture from crystalline to fibrous, is clearly visible in its effects in several instances which I have seen. It would appear that the cast-iron wheel acted more like a hammer on the axle, and as in the cold-awing process a gradual breaking up of the fibre at the back of the wheel goes on, which is shown by an annular ring, varying from 2 inch to 1 inch in breadth, the strength is completely destroyed of this outer portion, and a sudden shock of the wheel upon some point of the road completes the fracture.

Among other causes which contribute to the deterioration of axles may be mentioned—the practice of throwing cold water on the axle to cool it, when it has become nearly red hot for want of proper lubrication in the journal. With regard to the strain to which the portion of the axle between the wheels is subject, there can be no doubt if the form of the axle is so proportioned that any blow transmitted through the wheel is received equally along the whole body of the axle, and the sectional strength at each point is fairly balanced to resist the effect of the blow, the axle will then be best suited to prevent deterioration at any particular place. With the view of determining the weakest point of a common wagon axle under different circumstances, I made a few experiments, as follows:—

In the first experiment the power was applied to the flange of the wheel, and the resistance (as in the case of a railway axle when running) at the centre of the opposite wheel; the result was that the axle began to bend from a straight line 12½ inches from the boss of that wheel to which the power was applied, and there is no doubt that if the power had been continued the fracture would have taken place within the 12½ inches. As a proof of this, in the second experiment, an axle of the precisely same dimensions and form, being bent alternately backwards and forwards (the power being always applied to the same wheel at opposite points) was broken at the weakest point, viz. within six inches of the back of the wheel. In the third experiment the power and resistance were exactly in a parallel line to the centre of the axle, and the result, as might be expected, was a curve of a nearly uniform radius, proving that although the form of this axle was adapted to receive the blows of both wheels at precisely the same instant, and to the same extent (an impossible circumstance in practice), it was not suited to receive alternate strains or shocks, to which all axles are subject in ordinary use. The sizes of the axles in the above three experiments were precisely alike. In the fourth experiment another axle of the same dimensions was taken, and reduced at the centre in a lathe to the following dimensions:—The axle was divided into eight equal spaces from the back of the wheel to the centre of the axle. Immediately at the back of the wheel the axle was 4 inches diameter, and the deflection was 9½ inches; at the first space the diameter was 3½ inches, and the deflection 8½ inches; at the second space the diameter 3.3 inches, and deflection 7 inches; at the third space the diameter 3.1½ inches, and deflection 5½ inches; at the fourth space the diameter 2.16 inches, and deflection 4½ inches. Up to this point the axle maintained a straight form from the back of the wheel, and from this point to the centre of the axle, as shown by the deflections, it assumed a fair curve, proving that the axle was weaker towards the centre than it ought to have been, and that the first 12 or 14 inches from the wheel having maintained the straight form was stronger in proportion. In the fifth experiment the axle was reduced to two inches and a half in the centre, and with power applied similar, as in the last case, the weakness at the centre was more perceptible. In the sixth experiment the axle was made of another form, weaker immediately at the back of the wheel and at the centre. We had here two bends or curves, with a straight portion between them. In the seventh experiment there was an improvement upon the sixth, but it did not realise a perfect balance of strength at the different points. In the eighth experiment, this was fairly accomplished, the proportion being as follows:—From the back of the wheel to the centre of the axle, the sizes were 4.1 inches diameter, 3½ inches diameter, 2½ inches diameter, 2.13 inches diameter, 2½ inches diameter, 3.1 inches diameter, 2½ inches diameter; the half length of the axle being divided as before into eight equal spaces.

It must be evident that this can only be an approximate result, but we found that these proportions enabled us to attain the nearest approach to a regular curve in bending the axle; and it is worthy of notice, that when the dimensions of the axle at the journal and in the boss of the wheel are determined, a calculation to ascertain the exact proportion between the wheels seems to confirm the above statement of dimensions in the eighth experiment. The greatest strain to which this portion of the axle is subject, being received as the bottom flange of the wheel, and transmitted through its radius, the amount of strain which any portion of the axle has to resist is inversely as its angular distance from the point of impact to the radius of wheel. Assuming the blow on the flange of the wheel to exert a breaking force equal to 102,359 lbs., and the diameter of the axle to



be 4.71 inches to 10.45 this blow, then, dividing the axle into four equal spaces to the centre, the portions breaking force at each point would be as follows:—At the first, 4.94 lbs. the relative diameter, 4.71 in.; at the second, 4.94 lbs. the relative diameter, 4.93 in.; at the third, 6.77 lbs. the relative diameter, 4.71 in.; at the fourth, 10.45 lbs. the relative diameter, 4.92 in. With regard to engine axles, these proportions will apply where no circumstances exist of employing the centre of the axle for transmission of power. The crank axles of locomotive engines cannot be treated by any of the rules applicable to straight axles; and our experience would seem to prove that, even with the greatest care in manufacturing, these axles are subject to a rapid deterioration, owing to the vibration and jar which operates with increased severity, on account of their peculiar form. So certain and regular is the fracture, at the corner of the crank from this cause, that we can almost predict in some cases of engines the number of miles that can be run before signs of fracture are visible; a certain amount of injury can be prevented by putting counter-balance weights opposite to each crank, which lessens the vibration very considerably. It is right to observe in this place, that to some extent the injury to all axles may be increased, if the wheels in which they are fixed are not properly balanced, and I have no doubt that a great portion of the constant vibration to which they are subject may be traced to the knocking action of the wheels upon the rails, owing to a want of balance. The question of deterioration of axles arising from various causes, which I have enumerated, is a very important one to all railway companies; that some change in the nature of the iron does take place is a well-established fact, and the investigation of this is most deserving of careful attention.

I believe it will be found that the change from the fibrous to the crystalline character is dependent upon a variety of circumstances. I have collected a few specimens of fractured axles from different sources, which clearly establish the fact that the iron is strained. It is impossible to embrace in the present paper any exposition of the fact on this branch of the subject, but so valuable is the clear understanding of the nature of the deterioration of axles, that I am now registering each axle as it goes from the workshops, and will endeavour to have such returns of their performance and appearances at different periods as will enable me to judge respecting their treatment. When it is considered that on the railways of Great Britain there are about 200,000 axles employed, the advantage of having the best properties, the best qualities, and the best treatment to such an important and vital element of the rolling stock must be universally acknowledged.

After the reading of the paper, it was proposed that the discussion upon it should be adjourned, to give more of the members an opportunity of expressing their views on the subject, and to afford time to consider the important points touched upon. To assist a due consideration of one or two of these, the President remarked on the theory broached by Mr. McConnell, and held by many engineers, that continuous concussion changes the fibrous character of iron to crystalline. He (the President) could not admit the truth of that theory. The concussion to which a connecting rod of a locomotive was subjected, the 20 years' vibration upon the beam of a Cornish engine, did not alter the character of the iron; and in all his experience he had been unable to meet with one authentic proof of the theory of molecular change. With respect to the experiments made by Mr. McConnell on the power of certain forms of axle to resist fracture, he would remark, that though the results were undoubtedly correct, yet the test was not that to which axles in actual work were subjected. In the one instance the pressure was slow and continuous, in the other, the concussion was instantaneous. The force, therefore, to which axles in use were subjected was totally distinct from tension by slow pressure. Mr. Ramsbottom, Mr. Smith, and Mr. McConnell held that iron did change its character by continuous concussion; Mr. Slats, Mr. Cowper, and others, maintained the opposite view. Ultimately the discussion was adjourned, and the thanks of the meeting voted to Mr. McConnell.

The third and last paper read was "On Naamih's Patent Girders and Fire-proof Floors," contributed by Mr. S. Lloyd, of Wednesbury. The paper was illustrated by drawings and models. A discussion followed the reading of the paper, and after a vote of thanks to the President, the meeting adjourned.

### OPENING OF THE COAL EXCHANGE.

On Tuesday last, H.R.H. Prince Albert, accompanied by the Prince of Wales and the Princess Royal, went by water to the city, to open the new Coal Exchange. The event, which had for some time past been looked forward to with great interest by the inhabitants of the metropolis, passed off in the most satisfactory manner, and no unfortunate circumstance took place to mar the happiness which an occasion of the kind naturally diffuses. In this uncertain climate so much of the effect of public spectacles depends upon the propitiousness of the skies, that the first acknowledgments of a narrative of this kind are due to the weather. The day was magnificent, the sky unclouded, and it is not often that an October sun has shone so brightly and cheerily. Then the inhabitants of the metropolis were in the best of humours, prepared to enjoy the spectacle which they had been promised, and thoroughly disposed to do homage by their presence to a Royal visit, paid in honour of that useful mineral, which, as the chief of all its varied uses, warms the household hearth, enlivens the gloom of winter in every family, and is associated, perhaps, more intimately than any other product of mother earth, with "the intimate and dear delights" of family and home. It is true we owe it some grudge for blackening the walls of our edifices, for darkening an atmosphere which is seldom, under the most favourable circumstances, very transparent, and for destroying, in a variety of ways, those forms and attributes of beauty with which other great cities abound; but the Londoner is perpetually sacrificing effect to substantial comfort, and he reconciles himself, with admirable composure, to all the disadvantages which coal-burning bears along with it to the metropolis, for the sake of the benefits which it confers on himself personally. Not the least singular feature in the Royal visit, which has just taken place, is that it should have been made by the river, which, more than any other part of the metropolis, is the medium of the coal trade. Had Prince Albert made a tour through the great mining districts, and despatched in a wicker basket into the bowels of the earth, to witness the labours through which the temperature of the Royal palaces is preserved, he could not have paid a more significant compliment to the coal trade of this country than by navigating the Thames from Whitehall-stairs to the Custom-house. From one end of the year to the other, the signs of this trade are visible there beyond all others. Ungainly coalbarges are perpetually drifting up and down with the tides. The river banks are crowded with them, and they furnished, oddly enough, a good half of the display by which the Prince Consort and the Royal children were welcomed on the Thames.

In the *Mining Journal* of the 20th October we gave a detailed description of the building, the appearance of which seemed to delight the immense concourse of visitors to the opening ceremonies. Among the earlier arrivals were the Dukes of Wellington and Cambridge—the latter of whom, on some of the decorations of the building being pointed out by the former, could not forbear exclaiming loudly, "Beautiful—beautiful—very handsome!" Nor was it to be wondered at. They stood upon the floor of the great hall or rotunda, in which the market is to be held—a circular apartment 60 feet in diameter, having round its sides three tiers of galleries, one above another, from which the various counting-houses are to be entered. The hall is surrounded by a noble glass dome, the centre of which is 74 ft. from the floor. The panels of the walls have been ornamented by M. Sang, assisted by Mr. Bendixen, Mr. Beenen, and other artists, with decorations forming a series of pictorial representations of coal in its progress from the pit to the fire-place, the implements of the miners, and the like, with emblems of the Mersey, the Humber, the Aire, the Severn, the Avon, the Medway, the Thames, Trent, and Tyne. Opposite the grand entrance from Thames-street was a throne erected for her Majesty, covered with rich crimson velvet, with very handsome canopy and side draperies, and by the throne were placed three chairs of State—one of them for the Prince of Wales, surmounted by a magnificent plume of the Prince's feathers, made of spun glass. The various recesses in the hall and galleries were occupied with tables, on which was placed an elegant *déjeuner*, and which glittered with costly plate; all the tables, however, sinking into insignificance in this respect when the eye rested on the Royal table, and the superb array of gold upon the sideboard. The galleries were crowded with an assemblage of ladies and gentlemen in full dress, and the area was filled with the more distinguished personages, all in Court suits or in uniform, the Gentlemen-at-Arms living the circle.

On the arrival of Prince Albert (after the presentation of the address), the Royal party and suite passed up one of the staircases into the lower gallery, and along a part of it, till they came to the private apartments prepared for them. The rooms thus appropriated were three apartments, facing Thames-street, and intended to be the offices of Mr. Hill, the Lord Mayor's relative, and with whom his lordship was in partnership in the occupation of a coal factor. The rooms were very richly and tastefully fitted up, and in one of them was placed a beautiful model of the Coal Exchange. Many of the principal guests followed the Royal party, and on coming into the gallery, which is narrow and open to the hall, round which it runs, fenced in only by low palisades, every one who passed along was separately and distinctly seen and observed by the company. It was then that they first became aware of the presence of Sir R. Peel, who had been mixed with the throng. The right hon. baronet was no sooner recognised than he was welcomed with loud and general cheering, renewed again and again. He walked on, however, and without taking the applause to himself, entered one of the apartments adjoining the Royal rooms. On his return, a few minutes afterwards, the cheering became still more marked, the ladies joining in the plaudits by waving their handkerchiefs; and the right hon. gentleman then bowed in acknowledgment of the honour. The carpet was now removed from the floor of the merchants' area, that the floor might be seen. It is in the form of the marbler's compass, and consists of upwards of 4000 distinct pieces of wood,

the City shield, anchor, and other ornamental devices, are represented in the centre. The whole of these pieces were, only a few months since, either in the tree in the growing state, or cut from wet logs, and prepared for use in the course of a few days by a new method of seasoning, known as the "dewatering process," being the patented invention of Messrs. Davison and Symington. The name of the woods thus introduced are black ebony, black oak, common and red, English oak, wainscot, white holly, mahogany, American elm, red and white walnut (French and English), and mulberry. The black oak is part of an old tree which was discovered and removed from the bed of the Tyne river, about the latter end of last year, an account of which has already appeared. This tree is supposed to have grown on the spot where it was found, and, owing to its large dimensions, must have been at least 400 or 500 years old at the time it fell, but how many centuries it had been covered with water it would be impossible to say. The mulberry wood introduced as the blade of the dagger in the City shield is no less than a piece of a tree which was planted by Peter the Great, when working in this country as a shipwright.

The entire proceedings passed off in the most satisfactory manner; and of the countless thousands who witnessed the successive stages of the pageant, few (says the *Times*) have probably considered what special reasons there are that should claim for a British Coal Exchange the honour of a Royal inauguration; but, in truth, in no time or country has the market of fuel ever been so intimately and so variously associated with national prosperity and glory as in the present era of the British empire. If not the single element of our mercantile and political superiority, coal is at least absolutely essential; and could we suppose such an event as the exhaustion of the beds, it would be the final and utter catastrophe of our greatness. England would immediately sink into a third-rate power. Her population would have to fly from her empty pits, her drowned mines, her frozen furnaces, her lifeless railways, her paralysed manufactories, with the same wild despair that drives the Irish peasantry from their blighted food. Whenever we see the Pool crowded with colliers, or a monstrous train wending its way on its rail, we behold the vast fuel of a mighty hearth at which England, and, indeed, the whole world, is warmed and enlightened. Compare this with the period, not very remote, in our annals when an Italian priest, writing to the Pope, expressed his surprise at seeing a noble lady give baskets of black stone to her dependents, or the still more recent date when coal was positively forbidden in this metropolis; and we see in this wonderful transition the growth of a manufactory and commerce, a wealth and power, unparalleled in the world. It is just about three centuries ago that the comparison of the population with the resources of England was beginning to excite the most anxious misgivings even in the minds of far-seeing men. They saw the crowds driven from their villages by the conversion of tillage into pasture, by the destruction of castles, the prohibition of armed retinues, and the dissolution of the conventual establishments. They deplored what they thought the unwholesome increase and the cankers of a long peace, and beheld with bitter disappointment the successive failures of attempted colonies. Under these circumstances, the wisest trembled for the future; and there were even prophecies that England was now at end. Had those prophecies really possessed the gifts that they have claimed, they could have taken the philosophers of their day to the openings in the hill-sides, or a few shallow pits surrounded by rude "curbs," and pointed out a fountain of wealth destined one day to make all their terrors ridiculous, and prove that man does not live by bread alone; but by means ever in advance of his own narrow ken.

The severity of our climate, in the first instance, compelled us to ransack the earth for that which the surface, in many parts of England, has long failed to supply. As usually happens, the enterprise and vigour of our researches in the subterranean abyss have had a reward beyond our anticipation. We have discovered the element of an almost superhuman power—the Aladdin's lamp of untold treasures. This metropolis could not exist without coal. Without coal Lancashire would still be a moor, and the West Riding a picturesque district with a few rich valleys; without it we should not have dreamed of steamboats or railroads; we should depend on the feeble aid of the stream for the motion of our looms and our spindles; we should not be able to weave or to spin one bit faster than the Italians, from whom we stole our first mills, or perhaps, the Hindoos, from whom we obtained the material; we should long since have exhausted our metallic wealth as thoroughly as an earlier generation had exhausted our diluvial deposits of tin and the precious metals; in fact, we must long ago have been at a standstill; and industry, instead of going in a thousand directions to acquire new wealth for the empire, must have lost itself in the suicidal attempt of classes to prey upon one another; we could not have ventured to encounter the expenses of war beyond the mere protection of our soil; and had we been so rash as to defy a continent in arms, and fight mighty armies with subsidies and fleets, we should long since have been bankrupt. It is to coal that we owe all these things in our position and history. Our coal-fields are the rule foundation of this fair Cornishian pile, and England is as indebted to them as Egypt to her Nile, Athens to her schools, and Rome to her policy and arms.

In other countries the supply of this prime necessary of life is unfortunately allied with some circumstances of inconvenience and danger to society. We believe that all the sovereigns and aristocracies of Europe derive a considerable portion of their incomes from forests, a term which in the more cultivated countries merely denotes large tracts of underwood, cropped at intervals of seven years or longer, and floated down the rivers to the populous districts. Such forests, while they contribute but little to the beauty of a country, deduct largely from its agricultural resources. If the forests of France were surrendered to the plough, they would furnish employment and food for fresh millions. But there is a still more serious evil in the circumstances under which the continental nations are forced to obtain fuel. Their wood-cutters and charcoal-burners are almost without exception a rude and turbulent population, addicted to brigandage and conspiracy. Working often either in solitude or in bands—in either case without proper control, they lose the checks of civilised society, set up their own code, and involve the neighbouring agriculturists in a spreading demoralization. The moral influences of the coal-pit are not so dangerous. It is not so beautiful or, perhaps, so salubrious as the woods; few would prefer it who had the opportunity of choice; but the elaborate organisation of the pit, the alliance of labour with capital, the ingenuity and grandeur of the engines employed, and the superior science of the masters and superintendents, all tend to subdue, to discipline, and to methodise the minds of the collier and the miner; so that, whatever the comparison of their ease with that of the agricultural labourer, they undoubtedly are a much more docile and manageable class than the woodmen and charcoal-burners of the continent.

We have instanced special reasons for the honour bestowed on the Coal Exchange; and to those reasons we must add the science and taste displayed in making it not only an appropriate edifice, but almost a school of the industry with whose products it is concerned. It is an immense improvement on the cold, unmeaning structures of the last age. The example, however, need not stop here. There are other necessities of life besides coal worthy of Royal interest, and not less in need of it. We hope to see the day when her Majesty and Prince Albert, and their children still young, will stand as yesterday in the midst of the court and commonality of this metropolis, at the inauguration of other buildings, as useful, if not as ornamental, as the Coal Exchange. The extramural cattle markets and abattoirs of Paris are amongst the noblest monuments of the imperial care lavished on that city—the noblest because the most useful. The supply of water by aqueducts, or other means, is a Royal work. Should our Sovereign and her Consort live the years that we pray for them, they will still find fresh occasions for their constant solicitude and occasional presence in the industrial regions of this metropolis, and nowhere will they show to better advantage.

The first mention of coal in the history of our nation appears to have been as early as the middle of the ninth century; but the article was certainly known, and applied to many useful purposes, A.D. 1100. In 1239, Henry III. granted to the good men of Newcastle the privilege of digging coals, although it is less than 300 years since they became in general use, as fuel, in London; at which place, on its first introduction, one or two ships were sufficient for the whole trade. It appears by a charter of Edward II. that the coal of Derbyshire was known, and in use, especially in London, although its introduction was greatly retarded by the prejudice existing against such fuel as a substitute for wood in cities, as seen by a proclamation of the first Edward, and subsequently in the reign of Elizabeth, in which we find that the burning of stone-coal was prohibited during

the sitting of Parliament, lest the health of the knights of the shire should be thereby affected.

The Corporation of London have long been interested in the vend and delivery of coal, as may be seen by reference to an Act passed in the reign of Henry VIII., at which period the standard measure was the "sack of four bushels of good and clean coals." It also appears that, by subsequent Acts passed in the reigns of Charles II. and William and Mary, the rights of the corporation, with respect to the aforesaid vend and delivery, were confirmed, chiefly with the view of protecting the public, as is further evident by an Act of George III., which is entitled "An Act to prevent frauds and abuses in the admeasurement of coals sold by wharf measures, and otherwise." It will also be as well here to mention that, previously to the year 1832 (when the collection ceased), the Mayor of London had been, from time immemorial, entitled to a groundage duty of 1s. 6d. per ship on Tyne and Sunderland, and 1s. per ship on Scotch and Welsh coal.

We now arrive at the period when, by a more recent Act of George III., the corporation were empowered and authorised to purchase the parcel of land and buildings called the Coal Exchange, which had, up to this period (1807), been in the hands of private individuals—the same being vested in the mayor, alderman, commonalty, and citizens of the City of London, "for the purpose of holding a free, open, and public market for the sale of coals brought into the port of London; the said market to be holden on every Monday, Wednesday, and Friday in each week, from 12 of the clock at noon until 2 of the clock in the afternoon of each day;" and were further empowered to levy and collect the sum of 1d. per chaldron upon all coal, culm, and cinders imported into the port of London—the amount of such collection being principally applicable to "maintaining and supporting" such building; and by an Act, passed in the reign of his late Majesty William IV., the Coal Exchange was still continued and vested as above, and, in addition, the change of measure to weight was authorised—that is to say, from the chaldron (26½ cwt.) of four vats, to the ton of 20 cwt., now the standard weight.

In the year 1845, the coal trade of London petitioned the corporation, as trustees of the fund for maintaining and supporting the Coal Exchange, to enlarge or rebuild the same, which, from the unprecedented increase of the importation, was found inconvenient and totally inadequate for the requirements of the factors, merchants, and others engaged in such trade. The corporation, consequent on such petition, and in consideration of the circumstances, and earnestly anxious that the convenience of so large a body of men should be facilitated, gave instructions to their architect, Mr. Bunning, to submit a plan for their consideration, from whose design and superintendence the present admirably adapted, original, and elegant building was produced.

The following statistics, carefully collected from official returns, will furnish our readers with some idea of the amazing increase in the importation of this useful mineral, so conducive to the health, comfort, and prosperity of this nation:—It has been before stated that, about 300 years ago (say about 1550), one or two ships were sufficient for the demand and supply of London. In 1615, about 200 were equal to its demand; in 1705, about 600 ships were engaged in the London coal trade; in 1805, 4856 cargoes, containing about 1,350,000 tons; in 1820, 5884 cargoes, containing 1,692,992 tons; in 1830, 7108 cargoes, containing 2,079,275 tons; in 1840, 9132 cargoes, containing 2,566,899 tons; in 1845, 2695 ships were employed in carrying 11,987 cargoes, containing 3,408,320 tons; and during the past year (1848) 2717 ships, making 12,367 voyages, and containing 3,418,340 tons. The increase in the importation during the last 10 years—that is to say, from the year 1838 to 1848, when the respective importations were 2,518,085 tons, and 3,418,340 tons—is upwards of 90 per cent. Now, by taking 2700 vessels as the actual number employed, and by calculating such vessels to average 300 tons burden per ship, and giving to a vessel of that size a crew of eight men, it appears that, at present, 21,600 seamen are employed in the carrying department of the London coal trade.

FOREST OF DEAN RAILWAY.—A meeting of parties interested in the establishment of an improved system of railways to develop the mineral resources of the Forest of Dean, has been held at Gloucester. Mr. Sopwith, C.E., took the chair, and stated that he had been appointed by the Commissioners of Woods and Forests to inspect the district; and that the present meeting was convened for the purpose of ascertaining the general opinion of the parties interested, and particularly those who had memorialized the Commissioners of Woods and Forests on the subject of railway conveyance for the minerals of the district. He believed it was quite clear to all that the railways at present in the district were inefficient. He then proceeded to read a report he had made nine years ago to the Commissioners of Woods and Forests, on the tramroads of the Forest, showing the high rates charged to the coalowners, and the great disadvantages they laboured under in consequence thereof. The cost of conveying coal on the Forest tramroads varied from 1s. 8d. to 3s. 8d. per ton for certain distances, while the cost on the modern railroads in the north for similar distances amounted to only 8d. or 9d. per ton. Any plan which met with the support of the greatest number of the coal and iron owners would receive his first attention, and he would endeavour to promote the object they had in view. Mr. A. Gould said, that a plan for opening the Forest of Dean had been proposed, which seemed to meet with general approval. It consisted, in the first instance, of a communication with the River Severn, either at Purton or Brims Pils, from Fox's-bridge, a communication from Fox's-bridge to Whinsey, and from Fox's-bridge to the Grange as an outlet to the eastern country. He said it was high time that they should have some improved communication, otherwise all their property would be ruined. At Cheltenham persons were buying coals at 14s. per ton, while the coalowners of this district had to pay nearly 10s. per ton for tolls, &c., before they could get their coals into the market at Cheltenham. A long discussion ensued, in the course of which it was stated that the plan proposed would have the support of all the parties in the district, particularly if the Government would come forward and open some part of the proposed Forest Railway, or lend some money for its construction. The revenues of the Crown would, in that case, be raised from 4000£ to 16,000£ per annum. The Forest coalowners were willing to supply the very best coals at the pit's mouth for 7s. per ton—some of them were now selling it at 6s. per ton. It was estimated that a charge of 2d. per ton per mile would pay 8 per cent. per annum on the cost, and enable the Forest coalowners to convey their coals to Cheltenham at a cost of 3s. 6d. per ton, instead of 9s. 2d. per ton, the amount charged by the present mode of conveyance.

THE BRITANNIA BRIDGE.—An important process, amongst the other interesting stages of this great structure, is now being carried out, and has been proceeding successfully since the raising of the first tube to 3 feet above its permanent level of 102 feet above sea-mark on the 15th Oct. On its completion, in the course of a few days, the immense mass of metal will again be let down 3 feet, and fixed into its abiding place within the towers. The operation has for its object the joining the main tube securely on to the land tube in the centre of the great tower on the Anglesea side of the straits, and so completing one-half of the passage across. In effecting this it is found necessary to provide for the expansion and contraction of so great a mass of metal as that of 2000 tons, which from changes of temperature, are necessarily very considerable, the extreme variation in the length of one of the tubes between summer and winter, being nearly 12 inches. To make provision, therefore, for this constant alteration in length, which would otherwise endanger the stability of the whole structure, the middle of the great tubes are fixed in the central Britannia tower, in such a manner that they cannot move, but on either side where the tubes unite with those in the land towers, proceeding out of the latter on to the abutments on shore, they travel on moveable rollers of cast iron 6 inches in diameter, a portion of the weight being also supported at the top on balls of hard gun metal of the same size, working in channelled beams, and acting in the same way as the rollers. Besides these ancillaries, which are now being placed, and on which the tube was to be let down at the extreme ends, where the rails intended for the trains, in the tube, are joined to those on land, contrivances are used to prevent a gap from being formed by the contraction, which might otherwise endanger the safety of the trains. Some uncertainty has supervened in reference to the floating of the second tube; should the tide, &c., be favourable, it will take place before the close of this month, but if not, at the beginning of December. No such delay, unless contingencies occur, will be allowed to interfere in the final operations, as all the hydraulic apparatus will be brought into action for the lifting of the second tube, as soon as it is floated to the foot of the piers, so as not to interfere with the navigation of the Straits, but at once give the railway a route over them.

OPENING OF THE SHREWSBURY AND BIRMINGHAM RAILWAY.—It was intended by the directors to open this line to Wolverhampton on the 1st inst., but in consequence of their being of opinion that some portions were not exactly in what they considered a proper state, they have deferred it till the 12th. Capt. Wynn, the Government Inspector, was along the line a day or two ago, and reported favourably. The tunnel at Oakengates is considered now quite safe, having been thoroughly tested.

RHEUMATISM EFFECTUALLY CURED BY HOLLOWAY'S PILLS.—A sergeant of one of the regiments doing garrison duty in Hobart Town had been for years a martyr to rheumatism. He was under the care of the regimental surgeons, but deriving not the least benefit from their treatment, in despair, he had recourse to Holloway's pills, and, as by a miracle, this invaluable medicine has been the sole means of perfectly curing him, and he now enjoys the best of health. For obvious reasons, the names of the surgeon and the regiment are withheld, but Major Welch, of Hobart Town, will vouch for the accuracy of this statement. Sold by all druggists, and at Professor Holloway's establishment, 244, Strand, London.



## FOREIGN INTELLIGENCE.

**SOUTH AUSTRALIA.**—Letters and papers have been received from Port Adelaide, the 30th July, by which it appears that the mining interest of the colony has undergone no particular change. The last sale of copper at the Barra Barra Mine was 36 tons, which went at 73s. 2s. 6d. per ton, and was destined for the East Indies, and which, as a remittance, is thought likely in future to be the staple article, and will, consequently, lessen the drain hitherto made on the colony for gold for the various articles of Eastern produce with which the Adelaide market is supplied. The quantity of ore which left the Barra Barra Mine during the week ending the 7th July, was 43 tons; and of copper 16 tons 6 cwt. The quantity of ore arrived at the port was 30 tons. The exports of copper for the year ending June last had been 15,598 tons, of which the Barra Barra Mine produced 13,745 tons. During the same period 800 tons of lead were also shipped to England. The *South Australian*, in alluding to the great improvement which has taken place in the colony, refers to the receipts of revenue for the quarter ending April last, amounting to the sum of £2,875. 16s. 9d., against £2,767. 11s. 7d. in the corresponding quarter of 1848, being an increase of 14,998. 5s. 2d. in three months, and observes—“It is really difficult to conceive a revenue in a more flourishing state than the above indicates. After remitting £2000. to London, for a steam dredge, we presume, and paying nearly 50000. for public works and improvements, the expenditure is still about 10,000. less than the revenue. If this proportion continues throughout the year, which we see no reason to doubt, we shall have an annual surplus revenue of 40,000. We sincerely hope that this will not be allowed to lie idle, for there are numerous modes of expending it for the benefit of the colonists. The revenue is not the only indication of prosperity presented to the colonists. A comparative table of the assets and liabilities of the Bank of Australasia shows that, so far as that bank is concerned, our finances are in a most flourishing state, and we have reason to believe that the Bank of South Australia can show figures equally favourable.”—Our old correspondent, Mr. A. T. J. Martin, in a communication to us from the colony, says—“Parties coming hither must remember that plans of new cities look very pretty upon paper, whilst the citizens are knee deep in mud in winter, and buried in dust and vermin in summer, but were improving a little, where every thing has, even after 13 years, to be now created. Allow me to give a hint to her Majesty's Colonial Secretary. We want men of capital, and paved streets for industry and commerce, and some sign of the greatness of the empire to which we belong.”—Eleven ships, with about 1500 emigrants, had arrived in the short space of 14 days, a most acceptable addition to the labour of the colony, where it would meet with ready employment. The South Australian Railway and the Adelaide City and Port Railway Companies have amalgamated. The capital of the combined company was to be 50,0000., one-half to be provided by the English shareholders. A list of the prices of mining shares will be found elsewhere.

Accounts from Swan River, Western Australia, are to the end of July, and represent the colony to be in a very depressed state.

From New Zealand the accounts extend to the 6th of July; they state that the value of the exports at Auckland, for the quarter ending 5th April last, amounted to only 4786. The Kaw-aw Mines were progressing satisfactorily. Smelting-works were in operation, and it was expected that the produce of the copper mines would form a principal feature in the future tables of exports. About 100 people had left Auckland and the neighbourhood for California; they had sold all their possessions previous to embarking for the new El Dorado, and the consequence of so much property being thrown on the market had reduced the value of houses and land 50 per cent. At the last public sale of land there was only one purchaser, who bought at the Government upset price without opposition. There had been another slight shock of an earthquake felt at Wellington.

From Sydney we learn that 10 tons of ingot copper had been sold for 817. per ton. It was the first lot melted in the colony, and attracted attention.

Letters from Magdeburg mention the result of an experimental trial lately given to the coal from the mines of Dortmund, in Westphalia. On a comparison with English coal, which is there in general use, it is stated to possess much greater heating powers, and to be admirably adapted for railway purposes. It is expected that, in consequence of this result, it will be very generally used, so soon as the rates of transport by railway will allow of its being conveyed to a market.

**CALIFORNIA.**—The last accounts represent the existence of much sickness at the mines—the “silly season” comprising the months of July, August, and September. We learn, by the *New York Herald*, that “the receipts of California gold at the United States Mint, up to the 1st October, 1849, were—

At the Mint in Philadelphia .....	\$2,297,264 46
“ “ New Orleans .....	260,561 42
Total of this year .....	\$2,557,825 88
Add deposits of 1849 .....	44,177 00

Total deposit of California gold .....

Add to this, receipts since by the steam-ships *Falcon*, *Empire City*, and *Ohio*, say, \$700,000, and we have an aggregate of \$3,500,000 up to this time. This is small, compared with the receipts anticipated, and must disappoint many of the most sanguine believers in the richness of the California gold mines.”

A correspondent of the *Daily News*, writing from New York on the 17th Oct., says—“Yesterday the steamers *Ohio* and *Empire City* left this port for the isthmus, with a very large number of passengers, at least 800. The spirit of emigration seems in no way abated. It is, in fact, scarcely awake. This is the first time that Americans have had to cross the seas to reach their own territory. There is an excitement about it which suits the character of our people, but it is accompanied by a new set of ideas. In England, India represents to your adventurers, perhaps, what California does to us; yet with this difference—we have inexhaustible mines of gold, and India has yielded up most of its treasures. I presume that the difficulties now endured by our miners will vanish, so far as personal comfort is concerned. At all the placers good dwellings will shortly be found—steamers will ply on the Sacramento and Joachin—the cost of living will be reduced, and the operations of mining be more regular and scientific. I do not believe, from what I can gather, that one-half of the gold territory has yet been explored. In Lower California there is probably as much ore as in Upper California. The Mormons are gathering large amounts at their settlements.”

The *Pacific Weekly News*, a newspaper published at San Francisco on the 1st of September, gives the latest accounts from the gold regions in an article, of which the following is an abstract:—“The Sacramento still yields a good dividend of \$10 to \$15 a day. The new method of turning the river and of working in its drained channel has not always repaid the effort, yet it has succeeded sufficiently to make it popular. It requires a union of from 20 to 60 persons to build the dam. The Feather river, where the finest gold has been found, is yet a favourite stream among the diggers. It yields to good workers the average of an ounce per man. About 3000 persons are now engaged there. The Ayuba river is said to be the surest place for making money, and the Indian trade is also brisk there. A friend assured us he had sold common scarlet blankets at from four to ten ounces each. Of the three forks of the Rio de los Americanos, the north has now a majority of miners. The gold is of a light lemon colour, and when assayed is found to possess a greater quantity of silver than that of the neighbouring streams. Many have left the middle fork in parties for the mountain sources of the precious metal, but these parties have not been as successful as was expected. The Oregon men seem to be the luckiest diggers on these branches. The old-fashioned rocker is the only and the simplest way yet invented to separate the dirt from the ore. In future years quicksilver will, doubtless, be used; but gold is yet too plentiful to need the aid of amalgams. Upon the Sacramento and its tributaries the number of persons engaged is about 15,000. It is estimated that their gains, for the year ending next January, will be \$20,000,000. Upon the San Joaquin and its tributaries the number is 20,000, and their gains are estimated as likely to be \$20,000,000. The Tuolumne and Merced rivers have been merely skimmed over, yet with brilliant success, and many have turned their steps towards the ravines of the Calaveras, where a fortunate miner earned \$20,000 in two weeks. It is reported that new and valuable gold mines have been discovered upon the Turkeo river, just the other side of the Sierra Nevada, and that several parties from the northern forks were on their way thither. It is stated that from \$600 to \$1000 have been dug that day. If this report is true, the real diggings are just being discovered.”

The following are extracts from the *Placer Times*:

The month of August has multiplied the number of gold washers on the principal streams of the Sierra Nevada, but the prospects for the mass crowding on are but imperceptibly lessening. The waters are nearly at the lowest stage, and quite in proportion to the increase of labourers; the chances are rendered more favourable by this circumstance. New washings have been discovered, and old ones abandoned. We have no prodigious gold stories to relate, but confining ourselves to the simple assurance of good luck for those who labour, we treat not to defeat the expectations of the most visionary.

J. B. Taylor, who went on to San Francisco about two years since, as agent for a company in New York, is about returning to the States for apparatus to work the quicksilver mines he purchased on the ranch of G. C. Cook, which ranch, it is believed, is inexhaustible in its quicksilver. The large mines of Forbes and Co. stand upon this ranch.

At Mormon Island a company are engaged in scientific mining: they employ quicksilver in extracting the metal from ground previously subjected to the cradle, or pan, process, and with a machine invented for the purpose, average about \$200 per day.

We have seen several who have returned from the placer within the past few days, but they bring no news of interest. They represent things favourably, as all do who have been successful, but agree in the opinion that a man has to “suffer some” in this branch of productive industry. We learn that a party are operating on the Middle Fork with a “submarine armour,” by which ar-

rangements they take on many thousands daily of the dust. They think, when they get their apparatus fairly at work, they will average \$10,000 per day.—We have advice from the North Fork of a very flattering nature. Companies that have turned the current of the river are now taking out from \$5000 to \$5000 per day.

**Successful Gold Digging.**—Dr. H. Van Dyke, a member of the North Fork Dam and Mining Association, which company has recently completed a lateral canal at Bear's Bar, a little above the junction of the North Fork with the Rio Americano, has just returned from the scene of operations. The work of drainage had been completed only three days before he left, and though the company laboured under many disadvantages, they had raised, in this short time, over \$15,000. This association is composed of about 30 hard-working men, and from the result of the few days' labour since drainage, and the fine prospects of continued success, they confidently count upon a yield of about 10 cwt. per diem, each man, during the next and succeeding month. In confirmation of these statements, we are at liberty to refer the reader to Mr. R. Van Dyke, of the house of Bleeker, Van Dyke, and Baldwin, of this place, where specimens of the gold so got may be seen.

The *Memoirs* had arrived at San Francisco after a passage of 120 days from New York.

**The Science of Mining.**—The mines of California have baffled all science, and rendered the application of philosophy entirely nugatory. Bone and sinew philosophy, with a sprinkling of good luck, can alone render success certain. We have met with many geologists and practical scientific men in the mines, and have invariably seen them beaten by unskilled men, soldiers and sailors, and the like. The simple secret is, that gold has been thrown about promiscuously by volcanic power, and distributed along the margin of streams and in river beds by mountain torrents, and it is the hard working and lucky man who may restore it.

**GOLD FROM CALIFORNIA.**—Mr. Richard Holmes, late of this town, arrived from California, by way of New York, in the *Cassidy* steamer, on Sunday evening last. Mr. Holmes was well known in this town as foreman to Mr. Richard Crossly, boot and shoe maker, South Castle-street, and subsequently in business for himself in Whitechapel. A little more than two years ago his premises were burnt down, and he left this country for South America. Not liking the country, he started for California, long before the gold fever set in, and he has resided there altogether about 18 months. He left San Francisco on 2d Sept. last. During a part of last year, and at the beginning of this year, he was at work at the mines, and has realised a very handsome sum, as he brings home with him 50 lbs. weight of pure gold. He favoured us with a call yesterday, and showed us some of the gold dust, with several large pieces of the precious metal, which he had picked up from the beds of the river. The largest piece of pure gold which he secured weighed 85 ozs. He states that there is no doubt a great deal of gold in the country, but, with that exception, he added, “it is not worth a straw.” For three months last year he never slept under cover of any kind, and the softest bed he could indulge in was a rock. Every thing is exorbitantly dear, and there is a great scarcity of the fair sex. He left 220 sail of vessels at San Francisco. —*Liverpool Mercury.*

## Mining Correspondence.

## BRITISH MINES.

**ALFRED CONSOLS.**—The lode in the 60 fm. level, east of Field's engine-shaft, is about 5 ft. wide, good saving work for copper ore—quite as good as reported last week; the lode in the same level is about 4 ft. wide, and ore. In the 50 fm. level, east of the engine-shaft, we have a large promising lode, being mostly spar. The 40 fm. level is driven as far west as Wyld's shaft, and suspended; the men are put to sink Wyld's shaft, to ventilate this level. We think the shaft will resume sinking Field's engine-shaft under the 60 fm. level on Wednesday next, in a good course of copper ore.

**BARRISTOWN.**—There is no change in the bottom of the adit level—still producing about 1 ton per fm. west of the slide; the slopes in the back of the adit level are suspended—being very poor. The lode in the 24 fm. level, west of the engine-shaft, is about 2 ft. wide, with a mixture of lead through it, but principally blende and iron; we are saving a little of the lead, but nothing at present which I could report on its value. The cross-cut, south of kiln shaft, is now about 3 ft. south of it; and, according to diving, the lode should be between 5 and 6 fathoms south of the shaft at this point. In driving the western cross-cut south we have cut a lode about 1 ft. wide, perpendicular, with a good branch of lead, about 2 in. wide, on the north wall; from its present appearance, and the character of the lead (steel grain), it must be the same that we stopped in the bottom of the adit level, which was left pretty good, about 6 fms. under the level, but was abandoned on account of water; this lode was always perpendicular. We shall now endeavour to clean up those bottoms and prove it further.

**BEDFORD UNITED.**—In the 103 fm. level, east of the engine-shaft, there is no alteration. There has been no lode taken down in the 103 fm. level, east and west of Barley's winze. We are raising by the side of the lode in the 90 fm. level. The lode in the winze in the 80 fm. level is 2 ft. wide, producing a little saving work. There has been no lode taken down in the 70 fm. level east of Morwellham, on Friday last, August ore, 123 tons 4 cwt. 3 qrs., and sampled Sept. ore, computed 118 tons.

**BRYN-ARIAN.**—The lode in the 10 fm. level, west from the engine-shaft, is 4 ft. wide, but rather disordered and poor at present; the rise in the back over the same level, east from the shaft, is yielding 15 cwt. of ore per fm. The winze sinking under the deep adit level, east from the shaft, is producing 1 ton of ore per fm. The slope back of this level, west from the shaft, is yielding 1 cwt. of ore per fm. We have commenced clearing up the old men's workings under the adit level, on the great south lode, and find them varying in size from 6 to 14 ft. wide, and in many places, where parts of the lode has been left standing, there are good branches of lead ore. The water is quick, and I have no doubt the mine was abandoned by the former adventurers in consequence of the water being so powerful; but we have now a sufficient supply of surface water to work the mine at any depth. From the best accounts I can get from the old men, this mine must be about 22 fms. below the surface, and 15 fms. under the adit level; but it appears they had in the former workings no machinery, except tackles, in different places—so I think we shall be able to clear out the workings without a whim.

**CARTHEW CONSOLS.**—At the upper mine the summen have this week been engaged in repairing the middle shaft, and on various other work in the mine, which has necessarily kept them from doing little or nothing in the engine-shaft. In clearing the 48 fm. level south we are making great and no less cheering progress; we have now cleared between 30 or 40 fms. south of the middle shaft, and in every fathom our prospects are being brightened; we have found, in the back two last 20 fms., a very good branch of lead, varying from 2 to 8 in. wide. In the 28 fm. level east from the shaft, we have done but little this week, having been blocked up with tributers' work. The lode in the end in the 28 fm. level, has been producing very good stones of lead this week, and continues to look very promising indeed. Our tribute department continues to look remarkably well, and in my next report I shall notify some new pitches being set in the 48 fm. level, which holds out no small promise. At the lower mine, we are fast approaching, in the adit end here, that very desirable object, the upper mine lode; the ground continues in the end very good indeed, but the lode does not alter much in its appearance. Our average diving is about 9 fms. per month.

**COURT GRANGE.**—Capt. Matthew Francis reports—You will have much pleasure in being able to inform the proprietors, that the bottom level, driving west of the underground work, is in a lode containing a good course of mixed silver and lead ore for a width of 4 to 5 ft.—a very encouraging feature in this part of the mine, where very little trial has been made; and I entertain a very favourable opinion as to its bearing large masses of ore. I shall forward to you, in a day or two, a specimen of the ore. I have seldom seen better from the best mines of this country; and the ore drawing from that mine is of unusually solid quality, considering the large amount of silver it contains. The bottom western level is running through a large ore lode, containing much ore, of the underground work and for shafts. At Llantrisant, the level driving eastward in the 10 fm. level from surface, for the purpose of making a pit for lodging the ore, is in a good ore lode. The machinery in this mine works very satisfactory; and everything bids fair for a good mine. We are doing nothing for the present at East Pen-y-coel; but the work is in a forward state; and, as soon as we can apply ourselves to finish it, we shall make rapid progress—against which time no doubt we shall have the machinery from Cornwall.

**CWM ERFIN.**—Our stopes in the back of the 20 fm. level from the engine-shaft, 10 fms. east, are worth 51. per fm. The stopes from 20 to 30 fms. east of the engine-shaft, are worth 121. per fm.; ditto from 30 to 40 fms. east of engine-shaft, are worth 101. per fm. The sink under the 30 fm. level, 25 fms. east of the engine-shaft, is worth 121. per fm. The 20 fathom level, east of the winze-shaft, is poor; the 20 fm. level, east of Robert's winze, is worth 121. per fm.; the 20 fm. level, west of ditto, is poor; the stopes in the back of this level is worth 121. per fm.

**DEVON AND COURTENAY CONSOLS.**—The lode in the winze sinking below the 40 fm. level is 3 ft. wide, composed of capels and spar, with spots and small branches of ore; the lode in the stopes in this level is worth 51. per fm. In the cross-cut driving north in the 50 fm. level, the lode is not yet intersected, but the cross-course is looking very favourable, being strongly impregnated with iron, mundaie, and ore. The pitches in the back of this level continue to yield good work.

**DAREN.**—In a day or two you will receive a specimen of the ore discovered in the level Coal adit; this in the rise will now yield from 121. to 151. worth of ore per fathom, having a leader of solid ore for 5 in. or 6 in. in width, and many smaller strings. In the level 40 fms. above level Coal, and about 40 fms. below the surface, the ore ground stoping yields 81. to 101. worth of ore per fm. When the crushing-mill is fixed, we shall be able to return ore at a good profit, and, from the quantity of iron ore, shall not require to sink for a good mine; it will, however, be a wise policy to get only the water from the western part of the old mine, as we should, to make a great mine, bring as many parts of the lode to bear at once as possible; and, as all that we have yet tried is profitable ground, I see no reason to conclude that the body of lode now under water is otherwise; indeed, I undertake to say, that we shall find very valuable bodies of ore in that portion of the mine. We have now put a ladder road in the western engine-shaft, and are taking means to ascertain the best way of reaching the south lode, and the junction of it westward with the Daren lode.

**DYNGWYN.**—I beg to send you a report of the setting for November. In the 22 fm. level, the bottoms, both east and west of the engine-shaft, I have suspended, being satisfied of a good lode of ore going down; we set the engine-shaft to sink 5 fms. in the month, at 81. per fm. to mine lead, in the west end, four men lifted to clear the old stuff, and I expect the end is far enough west to set against the steel ore stopes; the east end is set to two men, at 41. per fm., to the winze, which is now full of water to the 16 fm. level; the lode is again larger, and a little ore coming in again in the end. In the 16 fm. level nothing yet can be done before the ends under are driven further, and communication made from the levels below. In the adit level east nothing more can

be done than has been to secure the level; in the adit level west, I am happy to inform you, we have at last got through the troublesome runs of stifle, and on Saturday last I went through to the sinks steel ore stopes, and, by throwing down a stone, found it fell into water. A tackle will be fixed, to-morrow, and no time shall be lost in getting to the bottom, where I hope to sink as fast as possible, and communicate this to the 22 fm. level. At Cyfarthfa Castle, I gave to four men, this day, 30s., to cut in 2 ft. north, where there appears to be some aldy ground by the side of the lode, which is much better to drive on, and shall cut in south through the lode again about 10 fms. further east. In Edward's stopes we have a large lode, but poor at present, with plenty of water running down them; the cross-cut below getting near the lode, and a quantity of water coming from the breast of the end—set to two men, at 50s. per fathom. The Cyfarthfa deep adit, to drive north towards the Esgargaled lode, by four men and a boy, for the month, or cut the lode, at 70s. per fathom; a shallow adit, to drive north from the level of the new road, to one man and a boy, at 10s. per fathom; we have about 15 fathoms to drive, and will cut the Esgargaled lode 30 fathoms deep; the stuff from the end will widen the new road. The middle level, 20 fms. west and 30 fms. below Jones's stopes, on the course of the lode, is worth 1 ton per fm., from which I send you two small stones of the ore—set the end to two men, at 40s. per fm. In the cross-cut, called Young's level, in the rough sketch sent you, we have about 5 fms. more to cut the lode; this is likely to prove a productive level—set this day to two men and two boys, at 45s. per fm. In Jones's stopes the lode is worth 101. per fm.—set to four men, at 40s. per fm.; should these stopes hold, and the lode cut good in the level below, of which there is every prospect, we shall have a new and interesting mine being opened up, and the old parts of the mine. The weather last week retarded our progress in the dressing department; I expect to have 8 tons of lead this month. I received a letter from the fondry that our castings are all ready, and shall be shipped as soon as they can get a vessel, or any other way that may be pointed out to them.

**EAST CROWDALE.**—The middle shaft is now down 8 fms. 2 ft. 0 in., and will be completed by the end of next month to the 36 fm. level; at this point the lode has improved, having well defined veins, from 3 to 4 ft. wide, producing good stones of tin. We shall confine our future operations to the sinking the shaft until we reach the 38 fm. level, where we intend driving east and west under the shoots of tin gone down in the level above. We shall let a tribute pitch in the back of the 17 fm. level at 13s. 4d. in 17, the takers to pay every expense, including drawing. The lead course said to have been seen in the Crowdale adit, we have also seen about 8 fms. deep, at the little shaft, behind Mr. Slesman's cottage; and we find its bearing to be 50° east of south, and underlying west, consequently it has not been seen in any of the explorations at Rix Hill; this course is from 4 to 5 ft. wide, but we cannot speak of its value, not being able to see the whole ground. Our copper will be ready for sale next week—we shall commence the carriage of it next Tuesday. The tin will be sampled about the 10th inst.

**EAST TAMAR CONSOLS.**—During the last fortnight the shaftmen have been engaged in preparing for, and fixing the plunger-lift in the 50 fm. level; it is now completed, and we shall recommence sinking in the course of two or three days. In the south end, in the 50 fm. level, the lode is 3 ft. wide, with an improved lead ore footwall. In the south end, in the 70 fm. level, the lode is 3 ft. wide, and worth 5 cwt. of ore per fm.; it is very fair for driving, and opening excellent tribute ground; in the north end, in the same level, the lode is 2 ft. wide, worth 6 cwt. of lead per fm., and in an improving state. In the south end, in the 60 fm. level, the lode is disordered, and produces but little ore at present; in the north end the lode is 2 ft. wide, worth from 6 cwt. to 7 cwt. of lead per fm., and appears to be improving; in the winze sinking a few fathoms behind this last-named end, the lode is 2 ft. wide, worth 6 cwt. of ore per fm. The water is again below the 25 fm. level, and we are enabled to resume extending this level northward. The pitches generally are looking well, and there is every prospect of maintaining, if not increasing, our present returns. The foundation of the new engine-house at Gullett's shaft is nearly cleared out, and I expect we shall commence building on Thursday next.

**ESCAIR LEE.**—The following is an account of the setting to-day for Nov.:—The deep adit east of the cross-cut, on the north lode, by six men, 4 fms. stent, or the month, at 71. per fm.; drove last month 2 fms. 1 ft. 3 in. The lode is looking very promising, and will yield, on an average, 10 cwt. of ore per fm.; but, in consequence of the end being so very wet, the men driving last month have made but little progress. The deep adit east of engine-shaft, on the south lode, by four men, 4 fms. stent, or the month, at 34. 15s. per fm.; drove last month 3 fms. 2 ft. 7 in.—lode poor, but looking a little more kindly than for the last four or five fms. driving. The winze, to sink below the 12 fm. level, by six men, 4 fms. stent, or the month, at 91. per fm. The lode is looking more promising, with a leader of lead, about 3 in. wide. The shallow adit, west of Morgan's winze, on the counter lode, by six men, 4 fms. stent, or the month, at 31. 10s. per fm.; drove last month 4 fms. 5 ft. 6 in. The lode is improved since my last report, and will yield, on an average, from 10 to 12 cwt. of ore per fm.; and as soon as we have opened a sufficient length on this lode, we will sink a winze on the same. We have eight men at work making a lobby and cutting wheel pit, in order to erect a crushing-mill.

**HAWKMOOR.**—The summen have, for the past week, been engaged sinking a fork in the bottom of the perpendicular (40 fms. deep) for fixing the plunger-lift, which will put us in a position to sink diagonally with more speed. In sinking this ground 3 fathoms north of the lode, we cut a branch about 6 in. wide, which is now in, cross to 2 ft., and is composed of fluor-spar, mundaie, and ore; the underlay is apparently about the same as the main lode, and I am induced to hope, from the kindly appearance of this new lode, it will be found of considerable importance in our next level. The lode in the 20 fathom level west is without alteration. Our crusher walls are very nearly complete.

**HEIGSTON DOWN CONSOLS.**—The 45 fm. level has produced some good stones of yellow copper ore in the past week. The 35 fm. level is without important alteration—a very promising lode indeed. In the 20 fm. level, west of Hitchins's shaft, we intend to cross-cut north from the present end, to ascertain whether the main part of the lode is yet north of the part on which we have been driving.

**HOLMBUSH.**—The lode in the 120 fm. level south is 8 ft. wide, composed of soft quartz, and occasionally stones of lead. The ground in the 130 fm. level, cross-cut south, towards the flap-jack lode, is as favourable as we could wish to see it (so as to stand without being timbered); every effort is still being made to reach the lode, which we hope, and at present have every reason to believe, will be a productive one, judging from its appearance in the 100. The lode in the 110 fm. level south is 5 ft. wide, composed of hard spar, kilns, shokan, and stones of lead. The flap-jack lode, in the 100 fm. level, east of the great cross-course, is 4 ft. wide, producing 6 tons of copper ore per fm. Our parcel of copper ores, weighed last Friday, at Calstock Quay, 39 tons 19 cwt. 2 qrs.

**KIRKCUDBRIGHTSHIRE.**—The lode in the 62 west is still 7 ft. wide, yielding from 15 to 20 cwt. of lead per fm.; the lode in the 62 east is 1 ft. wide, and unproductive at present. The lode in the 80 and west is 2 ft. wide, with a good branch of ore on the north side, worth 8 cwt. of lead per fm. The lode in the 40 and west is 2 ft. wide, yielding 8 cwt. of lead per fm. We intend to ship a cargo of lead next week.

**LAMHEROE WHEAL MARIA.**—I beg to forward a list of prices set on Saturday last:—Engine-shaft 2 fms., or cut the lode, at 71. per fm.; Davey's shaft to drive north 3 fms., or the month, at 81. 8s. per fathom—the takers to pay for filling, landing, drawing, and all cost incurred.

**MENDIP HILLS.**—We have now a tolerable large pile of slags prepared for the blast-furnaces, and as soon as the engineers have completed the alterations with the blowing apparatus, which is at present being done, we shall again commence smelting. We continue to remove the top rubbish from the beds of slagstack at Chatterhouse Valley, which is at present about 14 ft. thick, and I think, on the whole, presents a slight improvement in quantity; the quality remains much the same. During the past week we have done but little towards the completion of Uley dressing-floors, the carpenters being engaged in fixing sheds over the biddles, &c., at Blackmoor. I regret to say we have not yet sufficient water to enable us to continue working with the floors.

**PENZANCE CONSOLS.**—Since the last report, a great improvement has taken place in this mine, and it affords me no small degree of pleasure in being able to state that the lode in the bottom level, west of the engine-shaft, is proved to be a very good one indeed, about 6 ft. wide, and at the present time worth 227. per fm., or upwards. In fact, I may add, it appears much better in this level than it did above; the ground about it is very favourable for driving, and it is our intention as soon as Cartnew's shaft is communicated to the present bottoms (which will be within a month), to commence driving cross-cut to cut the south lode, which is highly to be expected, and which we have discovered, and is standing in whole ground; this lode is very rich for tin, therefore, from what has already been discovered, the prospects are most cheering, and it is the opinion of practical mining agents that this will make a rich and lasting mine. The stones of tin broken cannot be surpassed in this county, either for their size or quality—specimens may be seen at the mine, or Ballewidden. I may add that a great many visitors have favoured us this week, and inspected the mine, and their opinions and reports are cheering.

**SOUTH TAMAR CONSOLS.**—The shaftmen having fixed the plunger-lift from the 70 to 101 fm. level, and made the shaft all complete, are now employed in cutting tip-pitch, which will be finished on Thursday. In the pit, and in the bottom of the shaft, which is 1 fm. under it, the lode is 2 ft. wide, with a branch of lead 4 in. wide—a good work. In the 100 fm. level, the lode in the south is 1 ft. 6 in. wide, and worth 20 cwt. of ore per fm.; this end is very kindly, easy for driving, and getting under ground that was much more productive at the 97 fathom level. In the north end, in the 101 fathom level, the lode is 3 ft. wide, kindly, but not rich. In the 90 fm. level south, the lode is from 2 ft. to 3 ft. wide, worth 7 cwt. of lead per fm., and very easy for driving. In the 80 and south, the lode is disordered by a slide. In the 70 and south, the lode is composed of capel and fluor-spar, with a branch of lead on the footwall, worth 4 cwt. of ore per fm., and is likely to increase in size and productiveness. We are clearing the 20 fms. level south, and also a winze from the 30 to the 45; when this is complete, we shall recommend clearing the 35, and driving the 30 and. The lode in the different backs set on tributs is generally looking well, and there is every probability of increasing the returns.

**SOUTH WALES MINES.**—At Bodcall the shallow adit south, by two men 4 fms., or cut the lode, at 12s. per fm.; at Dalwin the deep adit, east of the Rhyned River, on the south, or the Fronogion lode, by six men, 6 fms. stent, or the month, at 21. 10s. per fm.; drove last month 8 fms. 1 ft. 6 in. The lode is much the same as last reported, looking very promising, and producing rich copper ore and lead; for the last 10 or 12 fms. driving we have not been carrying the whole of the lode; we shall now cross-cut it north, in order to ascertain its trend, &c. A winze to sink below the deep adit, by six men, 6 fms. stent, or the month, at 21. 10s. per fm.

**SOUTH WHEAL TRELANVY.**—The ground in the engine-shaft, sinking below the 40 fm. level, is still favourable, being a dark blue kilasstratum, 2 fathoms 4 feet 3 inches having been sunk through this last month, and is again set to sink for one month at 101. per fm.—water much as usual.

**TRELEIGH CONSOLS.**—The 125 cross-cut, at Garden's, is driving towards the lode. In the 90, west of ditto, the lode is 3 ft. wide, with good stones of ore, and is looking more kindly. In the 80, west of ditto, on the north, part of the lode, the lode is 2 ft. wide, worth 22s. per fm.; in the 80, east of cross-cut, on ditto, the lode is 3 ft. wide, worth 61. per fm.; in the 80, west of Garden's, on the south part of the lode, the lode is 1 ft. wide, at present poor, but look forward to better results; in the winze below the 80 the lode is 15 in. wide, with stones of ore—expect to hole in the 90 next week. In the winze below the 70 the lode is 18 in. wide, with good stones of ore, and is looking kindly. In the 60, west of Garden's, the lode is 1 ft. wide, poor at present, but coming under kindly ground. At Wheel Earent, the engine-shaft below the 30, now down to the 40 fm. level. The 40 cross-cut, north of engine-shaft, is driving towards the lode, which we expect to cut next month; the 40 cross-cut, south of ditto, driving towards the middle lode. In the 30, east of ditto, the lode is 2 ft. wide, worth 51. per fm.; in the 30, west of ditto, the lode is 20 in. wide, with stones of ore, and is looking more kindly. In the 20, west of ditto, the lode is 18 in. wide, with stones of ore; the 20, east of ditto is suspended. The middle lode, at Nicholson's shaft, below the adit, is suspended; in the adit, east of ditto, the lode is 15 in. wide, with good stones of ore.

**WEST WHEAL JEWEL.**—The 85 fathom level, west of Williams's cross-course, on Wheal Jewel lode, is unproductive. The 70 fm. level west, on same lode, is taken down in the past week. The 47 fm. level, east of ditto cross-course, on same lode, is worth 31. per fm. The deep adit, west of ditto cross-course, on same lode, is un-



lord's dues, 2947. 5s. 10d.), 44237. 11s. 6d.; materials sold and rents received, 477. 14s. 2d. = 44717. 5s. 8d.—By July and August labour cost, 31297. 15s. 6d.,

power; in the interim, however, the horse-pumps will enable us to lay open many fms. of the lode, both at Masterman's shaft and Anstey's. In the 30 fm. level, where, by discovering the dip of the lode, and the dip of the ore, we shall be in a position to judge where to erect the steam-engine, shortly expected from England. In conclusion, the question must naturally arise—Why is it that a greater quantity of copper is not raised? To which I reply, we are now opening the mine; six men can drive no more than 10 ft. in a month, at 30¢ per fm.; but when the mine is opened, the same kind of ground can

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rates, 11. 10s. 9d.; doctor and club, 471. 15s. 11d.; materials, 7042. 13s. 3d.; sundries, 18s. 10s. 11d.; in part towards law costs, in case of Tucker v. Fox, 1641. 17s. 6d.; leaving profit on the two months of 4191. 2s.; to which add balance last account, 1421. 11s. 10d.—makes a total of 18402. 13s. 10d.; from which deduct dividend, 6402, paid in Sept., leaves now in hand, 12002. 13s. 10d.

**WHEAL BLINOWE MINE.**—A general meeting of adventurers was held at the mine, on the 23rd October, when the accounts were presented, showing—Balance due to pursuer, 2321. 18s. 6d.; cost for June, July, August, and Sept., 4891. 0s. 11d.; merchant's bills, 891. 15s. 10d.—8112. 15s. 3d.—By tin sold, August 31, 2291. 5s.; tin sold October 20, 1001. 1s. 2d.; calls, 1502—leaving balance of 3891. 9s. 1d. The accounts were passed, and a call of 28s. per share made. From the report of the mine, as well as from the reports of other agents who have inspected the mine, it appears that the appearance of the east and west lodes, where they have been cut in the 15 ft. level, precludes the hope of any returns being made from them to assist in driving the 30 ft. level, to intersect the lode at that depth. The object which the adventurers have always had in view cannot, therefore, be accomplished without further calls; and, as some of the adventurers are in arrears for former calls, it is deemed advisable by those who have promptly paid, not to incur further responsibility; and, therefore, resolved that the mining machinery, materials, and everything belonging to the mine, be disposed of by public auction, and the concern wound up as speedily as possible, and that a committee be appointed to assist the pursuer in carrying the same into effect.

**WHEAL MARY CONSOLS.**—At a meeting of adventurers, held at Liskeard on the 24th Oct., it was resolved—That the committee, appointed at last meeting, having now reported that the lodes of the mine are ready to take up 32 (256th) shares, at the rate of 21001. for the whole of the mines and materials, payable by acceptances at three and nine months, and that some of the committee, and other present adventurers, will carry on shares on these terms, this meeting assents to a sale for the above sum, and directs the pursuer to offer shares to all the adventurers for their acceptance on or before the 15th prox.

#### MINING IN THE CARADON DISTRICT.

Sir,—Will you favour me with space in your valuable Journal to give publicity to some remarks respecting the prospects of the mines in this neighbourhood? My object is to inform the public what is doing; and I am happy to say that great improvements have recently taken place in several of the mines.

**THE PHOENIX MINE.**—They have a good course of copper and tin here, both in one lode—in the capel, and a good course of copper in the main body. Before I proceed further, let me remark on the utility there is in having persevering and experienced agents, as it is generally understood in the neighbourhood that the present gratifying condition of this mine is mainly owing to the undaunted perseverance of her excellent manager, who has superintended all the operations through the greatest difficulties, and succeeded in making her a paying and, I believe, a lasting and profitable mine to the adventurers.

**MARKET VALLEY MINE.**—This is much improved of late, and likely soon to rank among the dividend-paying mines, if the standard keeps up; in fact, she more than pays cost at present. Perseverance appears to be what is wanted in many sets, or they would not have been abandoned, but rather paying the shareholders, ere this, for their outlay. Such is the case with many in this district—had they been wrought to half the extent that the Market Valley has, they would now appear monthly in the ticketing list of sales.

**SOUTH CARADON MINE.**—After having for some months fallen off in her samplings, this mine has again improved. The agents have discovered a fine course of copper in their bottom level, on Clymo's lode, in the eastern ground, coming towards the eastern engine-shaft, which was set to work this summer. I may truly say that this mine has been kept alive by the united efforts and skill of the Messrs. Clymo, who hold about, or more than, one-half of the property. Had they worked the mine as many others would have done—viz.: "dug out the eyes" of the lodes (as we miners say) to make the earliest returns, she must have gone down, or ceased to work; but, no! said they, rather stop our dividends for 12 months than lessen our outwork. By this means the mine is in full operation.

**WEST CARADON MINE.**—This mine never was so rich as at the present time. I have been informed that the agents have now in operation eight very productive lodes. She is, at this time, the second-best paying copper mine in the county, and likely to be as lasting as any.

**CARADON WHEAL HOOPER.**—This mine has produced some very rich copper ore of late, from three different lodes, about 40 or 50 fms. from surface, in kilias, south of the granite. These three lodes must meet between this and the next level, which will be 12 fms. below; the three branches will average about 5 ft. in width; 2 are underlying south, and the southern one underlying north, which appears to be the master-pit, as it is the largest, and, as soon as it is intersected, drew off all the water from the other two, which before were very wet. Between these lodes are many branches, some 6 inches, and others not more than 2 inches wide. From the lodes they have broken out 2 tons of rich yellow copper ore, better than which does not exist in England; indeed, it is such as to warrant large returns. In the next level, the shaft is sunk 62 fathoms below the present level, which is 58 fms. below surface. It may appear strange to many of the shareholders to hear that the copper was taken from the same level as that we commenced sinking the shaft from, that being 58 fms. deep, and where the ore is only 40 fathoms deep; such, however, is the case; the descent of the hill, and the host of levels, have taken off from 18 to 20 fathoms. The shaft is in granite rock, of a bluish colour, which is found to be most congenial for copper. There is one very large lode near the shaft, about 6 fms. south. We shall not have far to drive to intersect this, after the shaft is put to the 70; from this we have broken some good ore; and, I think, as this lode changes its underlay from south to north between the 50 and 58 fathom levels, as the granite nears it, that we may reasonably expect to see a course of copper in the 70. We have several lodes in the set, which now promises to pay the shareholders for their patience and large amount of outlay.

**CARADON COPPER MINE.**—This mine has been idle for a long time; indeed, but little has been done for the last four years, arising from the waste of money and time in attempting to draw off the water with the power of a 36-in. wheel, through the inability of some of the old shareholders to advance sufficient funds for the erection of a steam-engine, &c. This mine is now about to be spirited up by a new company of adventurers, who intend erecting a 50 or 60-inch steam-engine to drain the mine for the further development of the lodes, which exhibit such flattering prospects in the bottom of the 30 ft. level. I believe she will make a good mine, many of the same cross-courses passing through this set which enrich the lodes so much, both in the South and West Caradon Mines; the lodes also exhibit flattering indications, being composed principally of large quantities of soft spar, peach, and prain in abundance, with large stones of black and yellow copper ore.

**CARADON VALLEY MINE.**—This is about to be set to work immediately by a respectable party of gentlemen, who will at once proceed with the working operations, and who, there can be no doubt, will be well remunerated for their outlay. This concern is thought, by some of the most eminent miners and geologists, to be one of the best mineralised pieces of ground in the district; and an eminent miner inspected the set, in company with Capt. John Spargo, whose abilities as a practical miner are unquestionable, and whose joint opinion is, that there cannot be a better speculation in the mining world.

Caradon Wheel Hooper Mine, October 25.

JOHN SEYMOUR.

#### DIVIDEND MINES—LEVANT.

Sir,—In your remarks, in last week's Paper, you name Levant Mine as giving 301. per share per annum. I have held a share in the mine since April last, and have received successive dividends, as follows:—121., 121., 51., 51., 341. If the mine continues well, in the same proportion, 591. 10s. will represent the amount per annum. If I am correct, I believe thus naming it will insure the point being properly noted by you.—K.—Oct. 30.

#### ASTURIAN MINING COMPANY.

Sir,—In last week's Journal, your poetical and facetious correspondent, "R," in alluding to the gigantic myth, the Royal North of Spain Railway, states that M—by was not named the engineer. As, in my previous communication, I had informed you that Mr. Manby (for no doubt that gentleman is meant) had made the only surveys on the line, it will be useless contradicting that I wished to impose false information on you. I am not aware whether Mr. Manby was remunerated from the funds of the Royal North of Spain or the Asturian Mining Company; the general impression was, that it was a joint concern. Further, if you will refer to your advertising columns for 1845, the names of Messrs. Manby, Brothers, will be found as resident engineers.

London, Oct. 31.

THE IDLER IN THE ASTURIAS.

#### CAMBORNE CONSOLS.

Sir,—Though a very small shareholder in the Camborne Consols, I was much gratified with the account of the "discovery" in the mine, given in your last week's paper. If the 400 fms. should "dress up" to an average of 2501. per fm." then is this property, without going downwards, and independent of its copper, worth 100,0001. This would make each share worth 1001., for it is fair to presume the copper ore, from the present appearance of the mine, would pay all her expenses, thus leaving the silver ore net profit. Should the results bear out the present prospects, the Camborne Consols will be the great hit of the year. I trust we shall see, whether the workings improve or vanish altogether, a faithful report now and then in your Journal. "Truth is the soul of confidence."—AN OLD SUBSCRIBER: October 29.

#### MINING NEAR TAVISTOCK—WHEAL MARY EMMA.

Sir,—I should not have presumed to trespass on your columns, were it not to thank you for the kind attention you paid to some remarks made on my communication of the 4th of October, by "Mineralogist," who gives his lode, Golden Cross. I believe it was distinctly stated in my last letter, that there were large grains, or cubes, of tin in the lode—a term which I consider to be

appropriate and almost universal. For instance, a cube, rhomboid, the tetrahedron, the prism, the single pyramid, and various other figures, when crystallised, may be referred to either as perfect, or having undergone some change by truncation or otherwise. The gentleman says, in his letter of the 24th of October, that there are diversified opinions relative to the primary form of crystals taken by native oxide of tin. I may also, I presume, be allowed to form an opinion, in accordance with my own ideas, from practice and experience, which is generally a more shattering rule than a mere glance of theory. The simple term of cube used, I considered to be sufficient and explanatory. The writer's expression of the 180 varieties, convinces me that syntactical observations are the predominant features of his argument; and would merely say, in conclusion—

Cubes of tin, and cubes of copper;  
Cubes of lead—material matter;  
Golden rays are seen in bubbles;  
Fastidious critics are like stubbles.

Wheal Anderton Mine, Nov. 1. J. CARPENTER, NOT A BUSH FIGHTER.

#### WHEAL OAK.

Sir,—Some eight or ten weeks since, there appeared in your columns a letter concerning the Wheal Oak Mine, and which was taken notice of by the pursuer, who intimated he would supply periodical information to you about the mine. From that time, though there have been two calls (one of 10s., the other of 30s. per share), and a general meeting held, I have not seen any further authentic information from persons "in authority." If the concern be of too private a nature to render information through a public journal necessary, still, for the sake of the parties dealing with the mine, for such portion of the public as are buyers and sellers of mining property, and as a check on the managers, publicity, whether for good or bad, should be given to all mining matters through the medium of your Journal. Had there been no volunteering to give you notice of the state and progress of the mine, I should not now write, to remind the parties of the promise.—A SUBSCRIBER: October 29.

**GODOLPHIN MINING COMPANY.**—In the Court of Chancery, yesterday, in the matter of a petition, which had been presented under the Winding-up Act, on which the Vice-Chancellor K. Bruce came to a conclusion, in opposition to the decision of the Lord Chancellor in Wyld's case, that mining companies were within the Act, and made an order accordingly. The parties appealed to the Lord Chancellor, but pending the hearing, an Act, the 12th and 13th Vic., c. 108, amended the Winding-up Act, and declared that mining companies were to be included in its provisions. This decided the question of an appeal, but that of costs remained. Mr. Wood and Mr. Hislop Clark now appeared in that matter, and obtained leave to present a new petition.

**THE LAXEY MINES, ISLE OF MAN—GRATIFYING TESTIMONIAL.**—The shareholders of this company, under the presidency of George Wm. Dumbell, Esq., the chairman of directors, partook of a collation at the British Hotel, Douglas, on Tuesday, the 30th Oct., when they presented their manager (Capt. Rowe) with a very handsome service of plate, of upwards of one hundred pounds value, and bearing the following inscription:—"This service of plate is presented to Capt. Rowe by the Laxeey Mining Company, in token of their high estimation in which the company hold the efforts of Capt. Rowe, by whose skill and perseverance the Laxeey Mines have been rescued from an almost ruinous state, and placed in their present valuable and profitable condition."

**SHEFFIELD MINING COMPANY.**—The present briskness in the lead trade arising from the recently increased exports of this article, renders the laudable speculation of this company one of interesting importance. The amicable settlement of the dispute with the rector of Eyam is also matter of satisfaction, which will, undoubtedly, tend to the great interest and profit of each party. The level, or adit, is still progressing towards its final destination, when and where there will be a rich harvest—the just meed of these praiseworthy speculators.—*Sheffield Times.*

**QUEBEC MINING COMPANY.**—The shareholders of this company entertained Capt. Mathews, their superintendent of the mines, at a dinner, at which, we understand, the greatest harmony prevailed.—Mr. LE MESURIER was in the chair, and proposed the health of Capt. Mathews in very warm terms of eulogy, who, in responding to the toast, entered into many details, which gave great satisfaction to all present. It had been the intention of the chairman to have presented him with a piece of plate, which the officers and men at the mines subscribed for, but the time was so limited it could not be purchased, and orders have been sent to England for it. Capt. Mathews was, however, notified at the dinner that such a mark of regard from those in the employment of the company would be presented in spring, with which he was highly flattered, and begged the chairman to convey to the officers and men his warm acknowledgments.—*Quebec Morning Chronicle.*

#### MINING NOTABILIA.

[EXTRACTS FROM OUR CORRESPONDENCE.]

At the Wheal Vivian Mine, near the Indian Queen, in Columb, formerly known as the Gaverigan Mine, and now being worked by a Manchester company, an important discovery has been met with during the past week, by the opening of a fine tin lode, which is producing rich work.

**BLISLAND CONSOLS.**—I hear of an improvement here; they have cut a large lode predated with tin throughout, much better than the work I cleaned, and, after the erection of the machinery, I have no doubt of this making a dividend-paying mine. If the lodes strike into tin, you will quickly make large returns, as the lodes are large—in fact, they are regular champion lodes; and when they make tin, they are of that nature to expect very large returns, and would not likely be cut out or disordered as smaller lodes would, and the stratum is very congenial.

**CAMBORNE CONSOLS.**—I learn, from good authority, that some splendid specimens of ore, containing native silver, taken from the recently discovered silver lode, have been forwarded to the company's offices in London. It appears that the proprietors are keeping matters very close for the present, perhaps for the purpose of getting hold of the shares that might be in the market, and, consequently, there are but few inquiries for shares as yet; but I am inclined to consider the prospects good, as some of the local shareholders, who are likely to be best informed, would not sell under 201. per share. I also hear that Mr. Pendarves, of Pendarves, received some specimens from the same lode, and that others were exhibited on Saturday last, at North Roskear Mine, and estimated to be worth from 3500 ozs. to 4000 ozs. per ton of dressed ore. I am not aware what quantity they are likely to raise; but as they are busily engaged in arranging a temporary shelter for commencing the dressing of silver ore, I naturally conclude that they must be in possession of a good vein.

**HEMLOCK (SILVER-LEAD).**—In sinking our engine-shaft, we have met with a part of the lode, from which we have broken some exceedingly good work for lead, principally carbonate or whitelead, some specimens I send you this morning (Oct. 31). I did not expect to see anything of the lode until we got to the adit level, but it appears it made a heave out towards the shaft, and is now gone out of the shaft again, and I do not expect to see anything more of it till we reach the adit level. I hope this week will complete the shaft to the adit level, when we shall cut a whim-plat for drawing the stuff, and be able to set tribute to the men to raise lead, silver, and copper. This whitelead gives an entirely new feature to the mine, and it is the opinion of all the miners who have seen it, who know anything of the Hemlock lode (using their own expression), that there "are tens of thousands of it there." The men are now quite up to the mark, and are anxious to work it on tribute. There can be no doubt now that Hemlock will make a good mine; the lode is worth 101. per fathom for whitelead and silver.

**PENZANCE CONSOLS.**—These mines have, during the last year, returned to the adventurers tin to the value of above 9001. A new shaft has been sunk on the lode, which has cut a rich course of tin ore. The price hitherto obtained for the metal has varied from 461. to 521. per ton. In the opinion of several mining agents, the parish of Sancreed, in which these lodes are situated, offers a fair and encouraging field for mining enterprise. No other mine has yet been explored there, though the rich sett of Baleswidden, in St. Just, is on the borders of the parish of Sancreed.

#### ACCIDENTS.

**Cuddra Mine.**—James Cook, one of the three men who were drowned at Cuddra Mine, as stated in our paper at the time the accident happened, was found on the 24th, after the body had been in the water 14 days.

**Newquay Consols.**—William Holman was descending the footway in the engine-shaft with a pick in one hand and a borer in the other, with a torch in his mouth. He went down the first ladder, and in getting a light, he rested the borer on his hip, when the end of a bolt in the rod struck the upper end of the borer, and forced it into his thigh, from near the body, 9 in. downwards. There are some hopes of the man's recovery.

**Mine Accident in North Wales.**—On Saturday week, Capt. Jas. Rale, of the Eltharw and Pengwern Mines, Llanyrog, and formerly of Camborne, was putting up the span beam of a horse whim, about a ton weight, when close to its place, the plank on the top broke, and the beam came over. The first person struck was Capt. Rale; then a man named Powell; also one named Taylor. The latter had his arm broken, and Powell escaped with a few bruises. Capt. Rale being under the beam, pulling the rope, had his head dreadfully cut in three places, one finger cut open, his knee dreadfully bruised, and the mass of timber lodged on his breast, where he appears to have sustained the most injury. His cuts and bruises are getting on very favorably, and, as no bones are broken, great hopes are entertained of his speedy recovery. There were upwards of 30 men engaged, most of whom had a providential escape.

**Blaith Hill—Bolder Explosion.**—An accident, which might have been attended with far more serious consequences, occurred at the Chapel Hill Colliery, under the New British Iron Company, by the sudden explosion of the boiler (a round one), which worked the engine connected with those pits. The boiler, which had been much used, and had become very thin at the bottom, where it exploded, was forced with great violence to a distance of about twenty yards; but the ground being on a declivity, the boiler rolled three or four hundred yards further, passing across the lane, which is at the back of the church, through a garden, bearing down the several fences in its way. A man named James Wilson, who was taking the fire under the boiler at the time of the explosion, was badly scalded by the hot water from the boiler, and was bruised by some of the broken falling upon him, but under the skilful treatment of Mr. Kempton, surgeon, the sufferer,

we hear, is likely to recover. Fortunately no further personal injury was sustained. The damage done is otherwise considerable, and no blame, it is stated, is attached to the engine-man.—*Birmingham Journal.*

**Dillon.**—Allen Fereday was killed by a fall of earth, in a pit belonging to Mr. Ward, at Priestfield; and J. Clay was killed in a neighbouring pit, belonging to Mr. Fletcher.

#### MEETINGS DURING THE ENSUING WEEK.

**MONDAY.**—Kingsmill and Bedford Mining Company—Hall Moon, Exeter, Twelve. Grand Junction Canal Company—offices, at Twelve. Basingstoke Canal Company—Gray's Inn Coffee-house, at Two.  
**TUESDAY.**—Metropolitan Sewage Manure Company—offices, at Two. Highgate Archway Company—offices, at Two.  
**THURSDAY.**—West Flanders Railway—offices, at One. Farmers' and Graziers' Mutual Cattle Assurance Society—offices, at One.  
**FRIDAY.**—Llynvi Iron Company—offices, at One.

#### RAILWAY ECONOMY.

We yesterday inspected a new system of permanent way laid down upon a portion of the South-Eastern line, near the London-bridge terminus, and which, if permanently successful—and there appears no reason to doubt that it will be—must result in an enormous reduction of the working expenses of the railways of this country. The point of greatest expenditure to which the attention of railway managers has, for some time past, been chiefly directed is that for the renewal of the permanent way. We have seen, in the carefully drawn-up and very able report of Captain Hulsh, the general manager of the London and North-Western Railway, that, notwithstanding considerable portions of the line have the sleepers renewed by the contractors, a sum of 20,0001. per annum is considered to be required as a reserve, to be placed at compound interest, for the restoration of the rails and sleepers; and, if our memory does not fail us, Mr. Laing, the chairman of the London and Brighton Company, has estimated the cost of renewing the wooden sleepers alone at 731. per mile per annum. The new system of permanent way referred to—the invention of Mr. Barlow, the engineer-in-chief of the South-Eastern Company—will, if found to be as applicable as a four months' trial with very heavy traffic carried on with heavy engines seems to show, it really is for railway traffic, save five-sixths of the expense now incurred for the restoration of the wooden sleeper system, with its wooden key adjunct; and greater security to life and limb will be obtained.

By the new system of permanent way, the cross wooden sleeper and wooden key are entirely dispensed with, and what is stated to be a far less perishable material—the cast-iron. The joint sleepers, which have three chairs cast upon them, are 5 feet long, by 16 inches wide, and three-quarters of an inch deep; and the intermediate sleepers are 3 feet 4 inches long, and are of the same width and depth as the joint sleepers. The sleepers are divided longitudinally into halves, and are screwed together, so as to clasp the rails vice fashion. By this means the line becomes a continuous bar of iron, but the motion of the engine and train over it is less irregular and less unpleasant than upon the ordinary cross-sleeper road.

The total weight of these cast-iron chairs and sleepers, required for a double mile of railway, is 289 tons, which, at 41. 5s. per ton, for which it is stated the materials can be purchased, would give 12001. per mile. The wooden sleeper is estimated to last from 5 to 15 years, and when decayed it is utterly valueless. The iron sleeper will, it is said, last 40 years, and when no longer serviceable, it can be re-cast at a comparatively small expense. It is not alone in the stated less perishable nature of the cast-iron sleeper that a saving will be effected. The cost of relaying the road has to be incurred every time the wooden sleeper decays, so that this expense must be added to the greater cost consequent upon the perishable nature of such sleeper.

The cost of renewing the sleepers and chairs under the new system of permanent way is estimated by Mr. Barlow, with great confidence, to be not more than 201. per mile per annum, as against 731. per mile per annum, for wooden sleepers, exclusive of the cost of keys. The cast-iron sleepers with their chairs lie on the surface of the road, and their soundness can be detected by a glance. In the wooden sleeper system it is not possible to detect the soundness of the material without removing the earth, in which they are very generally embedded. We have no doubt that some such system of iron sleepers, that now laid down by Mr. Barlow would long since have been introduced, but for the comparative high price at which iron has stood for years past.

Directors were, on the one hand, unwilling to incur the greater original outlay required for iron than for wood, and, on the other hand, the question of the enormous cost of renewing the permanent way has but recently pressed itself upon the attention of railway directors. The general decrease of dividends has forced the question of working expenses upon the attention of railway managers; and we may take the new system of permanent way as the result of the experience of an eminently practical man, who has turned his attention to a consideration of the means by which the working expenses of railways may be reduced. The renewal of the wooden sleepers is now known to be a matter of very serious moment to railway companies; and if the new system should answer, as we believe it will, its general adoption would save some half million sterling in the working expenses of the railways of this country. We perceive that the South-Eastern Company have advertised for tenders for these cast-iron sleepers and chairs for about two miles.

#### RAILWAY AXLES AND WHEELS—NEW PATENT.

SPECIFICATION ENROLLED THIS WEEK.

**WILLIAM KILNER, engineer, Sheffield:** Improvements in manufacturing railway and other axles and wheels; and in machinery to be employed in such manufacture.—1. The inside surface of the tyre, after being bent into a circle, is raised to a welding heat, by placing it in a hollow fire or closed hearth, after which it is laid on a block, and the spokes, previously heated at one end, are successively welded to it. The nave is composed of two half navies formed of bar iron coiled into rings, with the internal hollow of less diameter at one end than the other; and the inner ends of the spokes are arranged upon the face (with the smallest bore) of one of the half navies, and the corresponding face of the other half nave laid on them. Care is taken to leave a space between each pair of spokes, and to punch holes in them, in order that the inside surfaces of the half navies may be welded together at these points. The nave and spokes are heated to the welding point by being placed above the fuel in a furnace, the top of which is made movable for the purpose of admitting the wheel after which they are welded together by swages, and the small ends of the half navies welded over the ends of the spokes. Or, two chains, united by a right and left hand screw-coupling, and passing through the centre of the wheel, are attached to the opposite sides. The wheel is placed in a projecting hearth above the fuel, and when heated to the proper degree of temperature, the chain is tightened and the weld formed. Instead of welding the spokes to the tyre after the latter has been bent into a circle, they may be welded to a straight bar of iron, which is then bent to the required shape around the ends of movable blocks arranged to form part of a circle, with intervening spaces to receive the spokes.—2. To give the necessary roundness to the tyre a bed plate is employed, which has a central vertical shaft, on which the wheel is placed, and is free to revolve thereon. Around the rim are two pairs of equidistant rollers, supported on spindles in the ends of four levers, the other extremities of which encircle two screw rods, whereby they can be made to approach or recede from the tyre, while above and beneath it are two other rollers, capable of being brought closer together. The rollers are driven by toothed gearing from any prime mover, and communicate the motion to the wheel, so that the tyre is gradually rounded, and the edge of the tyre bent over it by the action of the rollers. An adjustable scraper is made to act against the tyre, for the purpose of cleansing it.—3. For the purpose of turning the tyre, the patentee employs revolving circular cutters keyed on a shaft, resting on movable bearings, which can be made to slide up and down simultaneously by means of a hand screw.—4. The axles are constructed of two tubes, placed one within the other, or of a tube filled with bar-iron, and welded at the ends only, or of a number of bars of iron, curved and overlapping one another, to give a spiral direction to the fibre.—5. The use of the hollow fire or closed hearth for heating tyres to the welding point.—6. The projecting hearth.—7. Heating the inside surface of the tyre, by causing the flame and products of combustion to impinge against it, instead of by radiation.—8. Heating the spokes and tyre together, in order that they may be welded at the same heat; and arranging the spokes which have holes punched in them, at a distance from each other, between two half navies, to allow of the surfaces of the latter being welded together at these points, as well as over the ends of the spokes.—9. The employment of two or more rollers acting uniformly and capable of being caused to approach or recede from the tyre, in conjunction with the scraper, for the purpose of rolling and cleansing it.—10. Boring and turning the inside and outside surfaces of railway wheels by revolving circular cutters.—11. The compound hollow axle.—12. The railway axle, composed of a tube filled with bar-iron welded only at the ends.—13. The railway axle, with the bars of iron laid so as to give a spiral direction to the fibre.

#### DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

H. and R. Smith, Birmingham, defective plate-gas burner.  
W. Cook, Regent-street, hydraulic kna stove.  
A. Hills, Woodside, Croydon, metallic carboy basket.—*Mechanics' Magazine.*

**COMMUNICATION BETWEEN RAILWAY CARRIAGES WHILE IN MOTION.**—The Railway Clearing House Committee, at which all the leading railway companies are represented by their chairman, or other delegate, have, it appears, at the suggestion of Capt. Hulsh, urged upon the railway companies the importance of giving facilities for the guards walking safely along railway trains when in motion, by which means, it is said, accidents may often be averted. This, it will be remembered, was the plan carried out by Mr. Wyndham Harding, on the Bristol and Gloucester Railway, some years ago, where it was the means of preventing several accidents. It was also, after communicating with Mr. Harding, and receiving a great number of suggestions as to the best means of communicating between guards and drivers of railway trains, selected by the Railway Commissioners in 1847, as the system of communication best promising success. It is to be hoped that it will now be generally carried out. In the event of a carriage, or truck, catching fire, of an axle heating, a door flying open, or even suspicion that anything is wrong, the guard should be able to get to any part of a train at once.

#### JOINT-STOCK BANKS.

Shares.	Companies.	Paid.	Dis. p. cent.	Price.
22,800	Australian	£40	5	42 1/2
20,000	British North American	50	5	42 1/2
20,000	Colonial	25	5	64 1/2
20,000	Commercial of London	20	5	20 1/2
60,000	London Joint-Stock	10	5	17 1/2
40,000	London and Westminster	20	5	24 1/2
10,000	National Provincial of England	35	5	26 1/2
20,000	National of Ireland	22 1/2	5	18 1/2
20,000	Provincial of Ireland	22 1/2	5	18 1/2
10,000	South Australia	22 1/2	5	17 1/2
20,000	Union of Australia	25	5	24 1/2
60,000	Union of London	10	5	11 1/2

[From the Plymouth Journal.]

**WHEAL FRANCO.**—There is no alteration since our last.

**TAVISTOCK CONSOLS.**—The lode in the shaft maintains its size, but there is considerably more prain and soft spar mixed with the mundle.

**NORTH TAKAR.**—There has been a very valuable discovery made in this mine, the full particulars of which we hope to give in our next. The ore contains by assay 220 ozs. of silver to the ton of lead.

**BIRCH TON AND VYNNER MINES.**—In clearing the old engine, it is discovered that a level has been driven 7 fms. under the adit by the ancients, and very fine stones of tin are found in the level. The other parts of the mine are without alteration. Capt. S. Becombe inspected the mine on Monday.







## NOTICES TO CORRESPONDENTS.

- \* We must impress upon our correspondents, the necessity of invariably furnishing us with their names and addresses—not that their communications should, consequently, be noticed, but as an earnest to us of their good faith.
- \* A Student (Chester-le-Street).—The most celebrated mining schools are those of Freiberg, in Saxony, and Clausthal, in the Harz district, in Hanover. Lectures are delivered in both these colleges on practical chemistry, assaying, mining, mechanics, mathematics, geology, and mineralogy, by able professors, who are appointed by Government. Permission is given to the students to manipulate in the laboratory, and free access is granted to all the mines. Diplomas are given on passing examination, but it is not customary to appoint foreigners to any situation in the mines or smelting works. Living is very cheap in both districts, and the fees required would be trifling in comparison with those necessary in England; but a correct knowledge of the German language is indispensably requisite, in order to render all the advantages afforded by these institutions available.
- \* F. F. H. (Glasgow).—The manufacture of Britannia metal on a large scale first took place at Sheffield, about 1770, by two individuals of the names of Jessop and Hancock.
- \* An Old Subscriber.—A report of Mr. Remington's bridge, exhibited at the Surrey Zoological Gardens, was inserted in the *Mining Journal* of the 7th and 11th Sept., 1847. Several letters on the subject appeared on the 2d and 16th Dec., and 6th January last.
- \* R. C. G. (Gunnislake).—Red ochre varies in price from 5s. to 15s. per ton. If a sample is forwarded, we will ascertain its value.
- \* J. K. (Llandele).—Mr. Gurney's lecture, at the Polytechnic Institution, was published in the *Mining Journal* of the 3d March; a practical description of his invention will be found in the *Journal* of the 23d of December, 1848, written by Mr. Forster, of Weston Delaval Colliery. Mr. Matthias Dunn also forwarded a communication on the same subject, which appeared in our columns of the 24th March last.
- IMPROVED AIR-ENGINE.—Mr. Bagg's letter, in reply to Mr. Weston, did not reach us in time for publication in this week's *Journal*. It shall, however, appear in our next. Mr. Carr's letter is declined, as calculated to uselessly prolong the dispute.
- We are compelled to postpone numerous answers to correspondents, also several leading articles.—Mr. Mitchell's papers, on the Metallurgical Treatment of Ores, will be continued in our next week's *Journal*.

\* It is particularly requested that all communications may be addressed—

TO THE EDITOR,  
*Mining Journal* Office,  
26, FLEET-STREET, LONDON.

And Post-office orders made payable to Wm. Salmon Mansell, as acting for the proprietors.

## THE MINING JOURNAL

Railway and Commercial Gazette.

LONDON, NOVEMBER 3, 1849.

The *Mining Journal* is published at about Eleven o'clock on Saturday morning, at the office, 26, Fleet-street, and can be obtained, before Twelve, of all news agents, at the Royal Exchange, and other parts of London.

The great and gratifying increase of the iron trade in the principality of Wales is one of the most surprising circumstances in the domestic history of that district which it is possible for us to lay our hands upon; and, as might be expected, the increase of its population has proceeded nearly in the same ratio; for in Wales, as in every other place, sustenance, and individuals to receive it, stand in a close and intimate relation to each other. The total value of iron shipped from the counties of Monmouth and Glamorgan in 1847, fell nothing short of four millions sterling; and the value of coals shipped during the same period approached to nearly two millions sterling. In 1820, the value of coals and iron raised in this district of the principality did not amount to an eighth of the value realised in 1847. We point to these magnificent results in the industrious branches of our domestic occupation, as proofs of the diligence and success with which they are, and long have been, prosecuted in the great mining fields of this country. When such amazing results as these are wrought out by the judicious application of capital, it would be one of the strangest of conceivable circumstances, if that vivifying element was not largely attracted to this branch of trade—and it is so attracted. We are happy to say, that if there is any prevailing want in the coal and iron districts of the kingdom, it is not the want of capital or of occupation, but of an enlarged market for our raised produce in this department; and even to that improved and enlarged area of sale, we expect shortly to have the pleasure of pointing the attention of our readers.

We have but a word or so to say in reference to the culminating disturbances at the Cape. It does not matter a single straw to us, whether those who are promoting the present fermentation in that colony are of British, Dutch, or mixed origin; whoever they are, and from whatever branch of the European family they sprang, they have clearly yet to learn the first duty of good subjects. Protection they have long had, heaped up and brimming over. It is not yet a twelvemonth since the people of this island had to pay a million and a half sterling, to rescue these same Capelanders from the fangs of their Caffre neighbours, whom they had provoked, and from whose savage hands the sword of England alone released them; and now on the first occasion, and no very trying one either, in which it was in their power to give a proof of allegiance to the British Crown, and of gratitude to their deliverers, they are ready to wheel round and trample on the authority of the Crown whose subjects they are, and on the memory of the obligations they have so recently incurred. The case between them and the Government is shortly this:—The cabinet, deliberating long and deciding late, at length determine that it would be desirable and expedient to locate a limited number of convicts, in some part of the large unoccupied district subject to the Crown, at the Cape of Good Hope; but the leading lights of the colony, in their transcendental wisdom, thought otherwise; they declared it to be undesirable and inexpedient, and flew up as fierce and as fiery as so many rockets, protesting their determination to resist the proposed measure. It is no longer, therefore, a question of policy, but of power; and the only alternative presented by the existing state of things is, whether the Government is able to carry out and accomplish its intentions, or whether the colonists are able successfully to resist them. With regard to transportation as a secondary punishment, our opinions are before our readers, and at present we have nothing to add to or take from them. We have, for a series of years, been building new prisons, and trying new systems, at home, with results that leave the question quite undecided, or which point to transportation, on a limited scale, as being as good a method as any within the compass of our resources to devise. But the politicians of the Cape have far out-sailed this phase of the subject; they have left it a long way in the horizon behind them, and have decided with an unexpressed haste, characteristic of ignorant people, that it shall be, if they can make it so, an impossibility in their settlement. We should be happy to see the wishes of the colonists consulted, and even their prejudices respected, wherever it does not interfere with the general interests of the empire to give them that consideration; but, in this case, we should have thought a sense of their permanent obligations to the Crown, as well as their recollection of the manner in which we recently delivered them out of the hands of their aboriginal neighbours, would have taught them a more modest and submissive lesson. As to the result of this dispute we have no misgivings; for we are confident that the noble earl, who so well and so successfully conducts, for the Crown and people of England, the administration of her immense colonies, will not, in a case in which all law, all practice, and all precedent is on his side, allow the Government to be foiled in the execution of a fully deliberated measure by the glare of a few fire-brands from the moment burning at the Cape.

**SOUTH DEVON RAILWAY.**—The directors of this company have, in compliance with the suggestion of the shareholders' committee, resolved to submit to the special meeting, to be held on the 6th of November, a proposition for an application to Parliament for powers to raise the sum of £75,000, to be appropriated to the payment of the debenture debt, and clear the concern from all outstanding liabilities. This sum will constitute a distinct capital, to be called the "Mortgage Debenture Capital," divided into 57,600 shares of 10l. each. Of these shares 47,800 will be applied exclusively in redemption of the debenture debt, amounting to 478,166l.; the remaining 9,800 shares to be applied exclusively to clear off outstanding liabilities on the capital account.

## THE PILOT STEAM-TOWING COMPANY.

It is not because we see an array of well-known names—legislators, bankers, shipowners, and philanthropists—at the head of the Pilot Steam-Towing and Ship Rescue Company, that we augur favourably of the success of that undertaking; but because we believe that an addition to the mercantile steam-tug service of this country has long been wanting. We except no port in the United Kingdom from that remark. London and Liverpool may be better provided than other places; yet there is ample room for the employment of more steamers, of the description mentioned, in these, the two principal ports, and, as certainly, plenty of scope in the way of constructive improvements. "Anything will do for a steam-tug" was the notion that prevailed when that new mode of accelerating the ingress and egress of sailing vessels was first applied; and, up to the present moment, the adaptation to them of admitted improvements in model, steam equipment, and propulsive application, has been proportionately slow, both in London and Liverpool. And if we add half-a-dozen other ports, such as Bristol, Hull, Newcastle, and Sunderland, each more or less imperfectly served, and with similarly unimproved steam-tugs, we have then to notice that the scores of other scarcely less important harbours are wholly without what the *Shipping Gazette*, referring to the same subject, not inappositely describes as "such fine-weather aids and foul-weather necessities as well-appointed steam-tugs."

Here, then, are reasons enough, and to spare, for the employment of capital in a legitimate and, to all appearances, profitable manner. But there are more, and perhaps equally strong inducements for others than the mere money-makers to participate. The philanthropist will find them in the promised provision, held out in the prospectus of the company, of more extensive means (not unprofitable either) for the saving of property from wreck, and of life from destruction; as these steam-tugs, on the sea-board, are to be constructed for the safest possible contention with the stormiest weather, and to be fitted with life-boats, and every other apparatus requisite for such undertakings. The patriot will recognise them in the expressed determination that these steam-tugs shall be built strong enough to admit of their being armed with heavy ordnance, and formed into a brigade of gun-boats, in the event of war. And the moralist will discover them in the contracts of the company to submit all unadjusted claims for salvage, or other extra service, to arbitration; instead of having recourse to those expensive, and rather despotic, proceedings in Doctors' Commons, which have obtained for that court much of the same sort of unpleasant notoriety, at the water-side, as that in which the Palace Court has iniquitously gloried in throughout Westminster and its precincts.

All these considerations apart, however, the local maritime communities, the general mercantile interests, and, through them, the entire population of the country, must be interested in the improvement and extension of its steamers of every class; and, more than all, we are convinced, must that interest be felt as respects the construction and highly useful application of such steam-tugs as are to be introduced by the Pilot Steam-Towing and Ship Rescue Company. It only remains for us to anticipate that our augury of success for the operations of the company will be most profitably accomplished.

## THE COPPER TRADE.

A very useful production, entitled "Synopsis of the Cornwall Ticketings, from 1800 to the present time, and of the Swansea Ticketings, from 1815 to the same period," by Mr. W. Polkinghorne, of Fowey Consols Mine, which comprises the standard, produce, price, quantity of copper ores sold, amount of money realised, and the quantity of fine copper produced, with respective fluctuations for each year, as well for every six years, exhibiting also the totals and averages for the whole period collectively, will shortly be presented to the public. We have had an opportunity of inspecting the original sheet, which was exhibited at the meeting of the Royal Cornwall Polytechnic Society, at Falmouth—see *Mining Journal*, Oct. 6; and in that Number we gave a brief account of the varied information contained in Mr. Polkinghorne's Synopsis. The compiler has used much care and discretion in the getting up of his work, which must prove of great utility to all interested in the copper trade. Being on a handsome sheet, which, hung on rollers, can be suspended like a chart, the merchant and miner is enabled to see at one glance the state of the copper market in this century. The different valuations of the standard are denoted each year by coloured lines, differing in length, so that, for the highest, lowest, or intermediate years, the observer, by following the line, can at once obtain the information he requires, without even the trifling research of scanning the columns. The meaning of "standard" and "produce" is likewise clearly defined; and the whole sheet will be found of great interest, from its valuable tabular matter, not only to miners, but to statisticians in general—to the former it is almost indispensably necessary, and will form a valuable adjunct, which should be found in every mining office. An advertisement referring to the Synopsis will be found in another column.—*Mining Journal*.

**THE FRENCH POST-OFFICE CONTRACT FOR COALS.**—The contract for the supply of 21,300,000 kilogrammes of rock coal, for the use of the mail steam-packets, for the ensuing year, was adjudicated on Monday last at Paris. The competition is stated to have been greater than usual on the part of the French contractors, and the extensive coal proprietors of that country, against the treaty with those of England and Belgium, who have hitherto had the preference, their coals being of a far superior quality for steam machinery, and at a lower rate than they feel disposed to deliver at, wishing, if possible, to keep their monopoly. The prices accepted, it appears, varied from 26s. to 30s. per ton, according to the distance they were to be delivered. After a strong contest, the English had the advantage of the contract for 1850, and the Belgians a small portion of the lower prices, as the Director-General was not bound to accept any particular priced tenders. These contracts, and those for the Republic steam navy of France, being given in favour of British coal, creates a great jealousy on the part of the French proprietors of mines, although they know that their collieries are not equal in quality to the foreign, and, therefore, are strongly opposed to the Government making any alteration in the import duties, as it would oblige them to make a material reduction in the export prices they are now charging the iron forgers, manufacturers, railways, and the public generally, as they could not compete with their opponents; for if British and Belgian coal was admitted at a low duty, the consumption in Paris, Havre, Rouen, Lyons, and the chief cities and manufacturing and metallurgical districts would increase, to a great extent, in its favour, and thus put a stop to the monopoly they have so long enjoyed, to the prejudice of national industry and comfort of the inhabitants, who chiefly use wood as fuel.

**CONTRACT FOR COALS FOR ARABIA.**—The East India House will be ready, on or before the 14th inst., to receive tenders for supplying 3000 tons of coal of any of the undermentioned sorts, to be delivered at Aden, on the southern coast of Arabia:—West Hartley, Carr's, Buddle's, Davison's West Hartley, Hartlepool West Hartley, Stewart's Wall's End steam and Glasgow hard-splint coal (screened), Risen black-vein coal (hand-picked). Several further contracts are about to be entered into by the East India Company for supplies of coal for the use of their steam mail-packets, which we shall duly notice; and we hope that every one may have a fair chance of competition, and that these contracts will not be monopolised by the few.

**RAILWAY CARRIES.**—The total amount of calls for the month of November, as far as at present advertised, is 674,826l. against 1,691,629l. for the corresponding month of last year, and 2,042,718l. for the same time in 1847. The total for the 11 months this year is 19,015,790l. against 31,764,239l. for the same period in 1848, and 39,648,073l. in 1847.

**RAILWAY STORES.**—The general specification just issued of stores required by the London and North-Western Railway Company for the year 1850, conveys a very good general notion of the vast amount of materials required for working the traffic of this, the most important railway in the world. The "specification" extends over 25 pages of foolscap. Under the head of "bags, baskets, and ropes," we find, amongst 50 other things, that 1200 baskets are required, and 2729 bags, each to hold 4 cwt. of coke; 85 cwt. of flax of the best kind, for packing engine-glands; and 60 cwt. of spun yarn. Of "brass and brass-work," 352 cwt. of castings are required; 144 gross of screws; and 59 tons of locomotive tubes; 2298 brushes, and 1000 dozen birch brooms. Of "copper," 8960 lbs. of bolts from 1 to 1½ inch diameter, 12,200 lbs. of sheet of various thicknesses and dimensions, and 12,768 lbs. for fire-boxes, 3 and ½ inch thick. In the "coach trimmings, &c." department, 13,250 yards of canvas are specified, 1030 yards of blue cloth, and 1460 yards of lace. Of "coal," 18,104 tons are wanted. Of "crucibles for moulding brass," 2539 are to be contracted for; 110,000 leaves of gold leaf are wanted; 35 tons of axle-guards are to be tendered for, 50 tons of patent shaft bar-iron, 190 tons of fire or grate bar-iron, 404 tons of bolts, 13 tons of nuts, 102 tons of castings, 48 tons of Lowmoor or Bowling iron, 100 cwt. of nails, 62 cwt. of rivets, 6360 gross of screws, 1345 tons of Staffordshire iron, and 120 tons of Yorkshire iron; 31,552 gallons of patent olive oil will have to be tendered for, 142 tons 15 cwt. of rape oil, 4 tons 10 cwt. of raw linseed oil, 25 tons 9 cwt. of boiled linseed oil, 2350 gallons of southern, 28 tons of palm oil, and 102 tons of tallow. Of "timber and wood work," the company require tenders for 19,807 feet of alder planks, 145 loads of beech planks, 10,000 feet of baywood boards, and 91,000 feet of deal boards.

**CONSTITUENT PARTS OF TIMBER.**—The constituents of timber are the woody fibre, which alone yields the strength required—the sap contained in the vessels formed by this fibre—and also water. The constituents of the sap, differing in different kinds of wood, form but a small proportion in the bulk of timber, though it has a very perceptible effect on timbers, when applied to practical purposes, but still greater in effect, as well as amount, is the water contained in all wood. From experiments purposely made, it has been found that 100 parts of fresh cut wood contained the following proportions of water:—Mountain ash, 28.3; ash, 28.7; birch, 30.8; oak, 34.2; white fir, 37.1; pine, 39.7; red beech, 39.7; elm, 44.5; larch, 45.1; larch, 48.6. In recently felled wood, there is, therefore, from one-fifth to one-half of its weight of water (Schubler and Hartig).—*Architect and Building Operative*.

## THE ST. JOHN DEL REY MINING COMPANY.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—A fresh circular to the shareholders having been issued from the office of the St. John del Rey Mining Company, attempting to refute what I stated to them in my letter of the 16th inst., I trust you will insert my reply. It is quite true that, in my official capacity as secretary to the company, I extracted all the information respecting the mortality and bad treatment of the slaves, and handed the same to the chairman, who wrote the circular, and I also reported to the board that it had been sent to all the shareholders who received the last dividend. I admit I should have expressed my opinion that the whole of the statements were untrue, but I had no wish to lose my appointment, and I thought that any person possessing a particle of sense would have seen that it was a "puff."

The circular states, that there is nothing whatever in the advice from the superintendent that can, in any degree, warrant the imputation that the negroes have been overworked. It is not likely that he would criminate himself; but will not the testimony of two medical gentlemen, who have examined into the medical reports from Morro Velho, be admitted? Is the testimony of the two gentlemen who have recently arrived from thence to be disbelieved and disregarded? Is the fact itself, of the enormous mortality amongst the underground negroes, of which I shall presently speak, to be set aside? Is the evidence, which is shown by the increase of work done by each borer since 1847, and especially since the erection of the new 80-head stamps, of no consequence?

The great mortality among the slave population of the company at Morro Velho has been a source of the greatest uneasiness to the administration ever since the mine was first worked by the St. John del Rey Company. In confirmation of this undeniable fact, the company's correspondence shows that the withdrawal of the two medical men, who succeeded each other at the mine between 1834 and 1845, was caused by the uneasiness felt on the score of excessive mortality, as compared with the mortality of any other mining establishment in the neighbourhood, either Brazilian or English; and lately, under the present administration, with the fourth medical officer who has served under the company at Morro Velho, the mortality has exceeded all former precedent—I say all former precedent, because the chairman, in his circular of the 19th Sept. last, refers to an extraordinary mortality which occurred in 1840—viz.: 55 deaths out of a population of 500 slaves; but the comparison is not a fair one, the mortality of 1840 having its cause well understood.

I affirm that the recent mortality has been occasioned by over-work inside the mine. The mortality of 1840 originated in a wholly different cause; the deaths in 1840 occurred principally among the surface negroes; the cause of the mortality was this:—In the beginning of 1839, the Minas Geraes Company purchased, through its Brazilian agent, in Ouro Preto, about 120 contraband new slaves (melas caras), only recently imported into Brazil from the coast of Africa. These newly-imported slaves are quite unfit for any kind of laborious employment for a year or so, after the sufferings of the middle passage. After working some months in the mine of Morro das Almas, belonging to the Minas Geraes Company, they were transferred over to the establishment of Morro Velho in the latter end of 1839, the Morro das Almas Mine being abandoned, and the chairman of both companies being the same.

The administration of Morro Velho, in consideration of the unfitness of these newly-imported slaves for underground work, employed them wholly on the surface on light work; a great many, indeed, were placed in the garden which supplied the negroes with vegetables, rather for the purpose of occupation than of work. Notwithstanding these precautionary measures, a large number of these negroes died in 1840, whether from the effect of their previous work at Morro das Almas, or from their not being yet acclimated to Brazil, or accustomed to labour of any kind. Be this as it may, numbers of them died, and this was the cause of the great mortality in 1840; consequently forming no precedent or parallel to the mortality of 1848 and 1849, which has occurred amongst the most robust negroes in the company's service, and, as I re-state, among the underground slaves. Thirty-three first-class blacks, six second-class, and four third-class, have died from 1st January to 3d July.

The borers and kibble fillers are continually changing their occupation, one week boring and another week, perhaps, filling kibbles, or doing something else underground; therefore, the arduous manner in which the circular endeavours to make it appear that the deaths of the borers amounted to only 13, and one from accident, is easily seen through.

It is not, however, solely on the above-named result that I form my opinion; this opinion has been strengthened and confirmed by the assertions of two gentlemen who have recently returned from Morro Velho. Assertions made by them in my presence—to me, in fact; and it has been stated to others, by one of these gentlemen, that, so far from the negroes willingly working overtime, the superintendent has "feitores" (overseers) employed to hunt them out of hiding places, whether they resort to avoid working "overtime."

The two gentlemen I allude to must confirm these statements, and I most solemnly pledge myself that they made these assertions, and that not by any means in the way of secrecy. If the chairman had questioned these two gentlemen at the board on this point when they first arrived, I have no doubt they would have stated to him what they stated to me.

That the excessive mortality is wholly to be attributed to overwork I will not affirm; for some of it may, with justice, be attributed to the medical treatment, as the following facts will prove:—A female slave was sent to the hospital; the surgeon beat her, and sent her away. The party who had told her to go to the surgeon then wrote him a letter, on which he called and said, "Damn her, I will bleed and physic her." She returned to the hospital, and died in two days afterwards. Five slaves were ill, and sent to the hospital by the manager of the negroes. The surgeon sent them away, saying they were fit to work. They were consequently obliged to work; four of them died shortly afterwards, and one, as I have before stated, tumbled into the mine and was killed, not being able to see his way down the ladder. The allowing "overtime" to be worked at all by the underground slaves is a very questionable principle. That slaves, who perform a full day's work for nothing, may be induced to overwork themselves for something—for money—for themselves—only proves that they are willing to obtain a few creature comforts of the freemen, without reflecting, or indeed much caring, about the loss of health, which is remote, while the employment of a little money is present happiness.

This subject was very seriously and maturely considered by the administration in 1841, in consequence of the medical officer of the establishment then thinking that the underground slaves were overworked; and the administration, which always entertained the views above expressed, gave orders that no overtime should be worked for breaking ore, for the mere obtaining of more gold, but should be confined wholly to preserving the machinery and indispensable works in order. This system was pursued with very little, if any, variation until 1847. The freemen bore as much and no more, and they work no more hours than the slaves at regular duty, and yet they never work overtime. One would think, if the privilege of working overtime were so very desirable a boon, that the free labourers would avail of it. It is quite certain, that the administration would be very glad if they did; but they do not, and never have done so.

Whatever may be the real cause of such an excessive mortality as exists at Morro Velho, it is notorious that it has passed into a proverb in the country. In speaking of hiring slaves to Morro Velho, slaveowners say they will not send their slaves to the slaughter-house—"Mandalos para a azoaga." As for the alleged epidemics being the cause of the recent mortality, they come regularly round every year in succession. It is only necessary to examine the monthly medical reports for any series of years to see this. May and June, influenza, followed by pneumonia and pleurisy, until August, when dysentery begins, and, with some, fever lasts until March and April. It is regular and certain, and visits every other establishment at the same period with comparative little mortality. In fine, since the assertion has been made, in more than one public paper, that the mine slaves have been overworked, it would have seemed natural and reasonable that the two gentlemen who have recently returned from Morro Velho should have been questioned at the board of directors on the subject of "overwork"; but this has not been the case. The "least said, the soonest mended," has been the motto worn by the chairman.

One word on the costs. The monthly costs, as presented to the shareholders in the extracts from the correspondence, are no more the real costs than that in a railway company, fully established, calls paid up, and dividends paying, the real costs would be shown by buying locomotives and coke, to replace consumption, wear, and tear, and omitting to insert the cost of purchase in the revenue account. The cases are similar. What the railway companies have been doing in this way, this mining company has been lately doing. The consequence is, that the month's expenses, as presented to the shareholders, and inserted in the *Mining Journal*, are almost invariably less than the actual costs, or amount expended and become due. Many years since the capital account was closed, as regards everything in the way of stores or machinery, or any article of consumption; the cost-sheet used, therefore, to show monthly the entire debit side of all the liabilities incurred during the month in Brazil, or of which advice of payment in London was received. Nothing, however minute, was omitted. If 1000l. was paid, or became due for stores, and only 500l. worth were consumed, the whole 1000l. was entered in the cost-sheet; but some time after June, 1847, this system was altered, and an approximate estimate was made, and is still made, of what is known and supposed to be consumed. The defectiveness of such a system is proved by the fact of the actual monthly costs being greatly in excess, on the whole, over these estimated—these doctored accounts.

I know what I am stating; and investigation will corroborate my assertion. During about the last eight months, the old and new forms of costs have been received from the mines. Only the new deceptive form has been laid before the shareholders—a reference to both will confirm my statements. There are many points in my letter of the 16th Oct. which the chairman has not deemed it necessary to refer to, and which, therefore, do not require any further remarks on my part. With regard to the mine being fairly or unfairly worked, notwithstanding the fine accounts the chairman has inserted in his circular, I maintain that it is not fairly worked; and any person who understands mining, by looking at the map at the office, will say I am right. City, Oct. 31.

W. ROYCE.



## Original Correspondence.

## MINING SPECULATION—HOME AND FOREIGN.

SIR,—Amongst the varied, scientific, and useful information contained in your Journal, I have always been puzzled to discover the wonderful cause of attraction, which has swallowed up such a vast amount of English capital in foreign mines; because, if foreign speculations repaid the outlay of capital, and gave handsome profits, it would not be at all wonderful that people would invest money where they could get the largest returns; but that people should continue to go on for a series of years, losing by the million, is wonderfully strange, and altogether beyond my comprehension. There is, undoubtedly, something very tempting in the idea of a gold mine; but it is not all gold that glitters, and the enormous sums of money expended in foreign mines must convince the most sanguine that their expectations have been "far fetched and dearly bought." There must, however, be something very attractive in foreign mines, or the public would not continue for years to run after a shadow, and neglect the substance, which might be found at home. It is true that, in the managing of affairs at home, boards of directors, secretaries, commissioners, &c., at large salaries, might be dispensed with, and that the carrying on of any establishment without a staff of officials would be a *tame affair*; but when people discover that they have paid too dear for their *whistle*, it is strange, indeed, that they continue to pay the piper. Why it is that people are so fond of losing money with their eyes open, in foreign mines, is a secret best known to themselves, and to a reflecting mind it appears quite inexplicable, unless on the principle of the old adage—"In for a penny, in for a pound," "going the whole hog," &c. Among the foreign wonders recently brought before the public, the Asturian Mining Company presents itself in a character somewhat notorious, inasmuch as it would appear, by reports in your Journal, and also from a letter in the last Number, by "An Idler in the Asturias," that the company in question have expended some 225,000*l.*, and from the "glorious uncertainty" of Spanish law, have now the cheering prospect of their property being taken from them. This must be pleasant news for the shareholders, but who will pity them? The Asturian Mining Company, however, are not alone in their *glory*, as the following figures will clearly prove; and by way of illustration, let us take half-a-dozen of foreign mines as they appear in the Share List in your Journal, and we shall find the following amounts actually paid up, and also the present nominal value of each concern:—

	Paid up.	Present value.
Allen Mining Company	£ 72,500	£ 12,500
Asturian Mining Company	225,000	27,500
Imperial Brazilian	230,000	35,000
Copland Mining Company	140,000	45,000
National Brazilian	150,000	20,000
Mexican Company	300,534	Nil.

Now, here we have, in half-a-dozen mines, the small sum of 1,118,034*l.*, actually paid up; and supposing the shares sold agreeably to the prices quoted in the Share List, we have as a set off against this enormous sum just 150,000*l.*; but it is a question if 50,000*l.* could be realised by the sale of the whole lot, and which cost the public one million one hundred and eighteen thousand and thirty-four pounds sterling. The magnet that holds Mahomet's coffin suspended in the air must be insignificant, indeed, when compared with the powerful magnet that has attracted such a mass of money to the foreign mines. The grave, it is said, is never satisfied; but what a yawning grave for English capital are the foreign mines. But notwithstanding such astounding losses, we actually hear almost every day of old mines in Spain being resumed, and worked by English capital. John Bull is certainly a very extraordinary fellow, but as far as foreign mines are concerned, he has not only lost his patriotism but his senses. He loses sight altogether of the resources of his own country, and goes, hat in hand, to some poverty-stricken Don Whiskerando, humbly soliciting the favour to squander his capital. John Bull, you should remember that charity begins at home. Many of your children suffer from want of employment, and would thank you for it; and you would get a fair return from the investment of your capital; but in your foreign *spec* you will lose all, and the dons will laugh at your folly. There are yet mines and lodes, without number, in Cornwall, Devonshire, Derbyshire, Staffordshire, Lancashire, Westmoreland, and Cumberland, unexplored and untouched; but supposing, for a moment, that the mineral resources of those counties were exhausted, we have North and South Wales, Scotland (almost all virgin ground), and last, though not least, there is poor "Old Ireland." Surely, then, we have ample scope in the United Kingdom for the profitable outlay of all its capital, without ransacking the remotest corners of the globe to find spots in which to lose it by the million. In Ireland alone we have a redundant population *starving*, though able and willing to work, for want of employment; and yet, with this distressing fact staring us in the face, do we find John Bull lavishing millions in the Brazils in giving employment to slaves. The mines of Ireland, if only worked to a moderate extent, would give employment to the whole population, and yield ample returns for the investment of capital. Why is it, then, that the English capitalist will neglect the substance at home, and continue to run after the shadow abroad? There is something in all this perfectly unaccountable. Life and property would be just as safe in Ireland (much safer than in Spain) as in any part of her Majesty's dominions. A much smaller amount of capital would suffice to work her mines than in any other part of the United Kingdom; the ore is of a superior quality, and found near the surface; her coasts are studded with safe and commodious harbours. Water machinery might be applied to an unlimited extent, and from the distressed state of many of the landed proprietors, the royalties would be let for next to nothing; in fact, many proprietors would be glad to let their mineral property free, until the parties investing their capital had reimbursed themselves their outlay, in order that the people might have the means of support by their own labour; and notwithstanding all these advantages, Ireland, and everything Irish, is looked upon with disdain and contempt. If you ask a capitalist in England to embark in the most promising undertakings in Ireland, no matter how good, he gives you such a look, as if you had kicked him in a nameless place; the very name of an Irish speculation acts like a *scarerone*. What, then, can be the cause of such blind and ridiculous prejudice? The people are neither cannibals nor savages, but, on the contrary, they are, generally speaking, the most patient and peaceable people on the face of the earth. No people but the Irish would die by thousands from starvation in the highways and hedges whilst food was within their reach. That such was the case, it was my painful lot to witness, and I sincerely hope that I may never witness such another appalling and horrible sight. In concluding this long and hastily-written letter, I would fain hope that better days are coming, and that the English capitalist will yet reap an abundant harvest from the outlay of his money in exploring Ireland's mineral resources.

Mount Gabriel, County Cork, Oct. 25.

ANGLO-CELT.

## SAFETY FUSE.

SIR,—Allow me, through the medium of your columns, to address a few remarks to that important and respectable community of Cornishmen—the mine agents and superintendents of mines—which, I trust, will neither be considered meddling nor uncalled for, as my only motive is to see my neighbours (the working miners) pursue their vocations with all imaginable safety to themselves; and should the question be entertained by the agents and others, doubtless much good would result—not only to the working miner, in his greater freedom from accidental injury, but very greatly, in an economical point, to the mine adventurer, whose best interest certainly is to see the working miner, in his labour, best served with every necessary implement. Having so far prefaced my remarks, I am desirous of drawing attention to the reiterated complaints of late as to the introduction of certain defective "safety fuse" into numerous mines, to the use of which have mainly been attributed the causes of several most deplorable accidents, such as loss of sight, fracture and loss of limbs, and not unfrequently attended by fatal results. Now, these are facts which cannot be skulked, and they call loudly for the interference of the agent, whose discrimination should direct the choice of the best material, regardless of competition, and the petty saving thereto accruing. Not that I would for a moment encourage by an undue price to any manufacturer, but whose material had indisputably withstood the test of superiority, and let such take precedence. That many premature explosions originate in carelessness cannot be doubted, but more will inevitably occur from the "fuse" which, having failed in igniting the charge of powder, where the inconsiderate miner, in order to save himself the extra labour and annoyance of boring a fresh hole, proceeds to empty the one just missed, though it is admitted on all hands that this operation is fraught with danger. Well! so much for the pertinacity of the miner, who, knowing the danger, still persists in incurring it; may, perchance, be the hasty judgment passed on him; but a palliation may yet be pleaded for him, such as the following:—

Probably the hole was prepared for explosion at an early part of the core, which, being ineffective, ought to prevent his return to the place of working for at least six or eight hours, as there are many instances recorded where the charge has exploded after having lain inert for so many hours as above stated—consequently there must be an important loss of time, which the industrious miner endeavours to take advantage of, though at the risk of personal safety. Further, it is very evident that any pecuniary loss must eventually be sustained by the mine adventurer.

Having gone so far, I now entreat the superintendents and agents of mines to investigate narrowly into the origin of these complaints, and to patronise such manufacture as is only tested by its superiority. By so doing, I am deeply impressed that much prevention of accident will be the consequence, and the unpleasant imputation of indifference to the well being and comfort of the most deserving of the labouring classes would thereby never be established. I believe there are several establishments for the manufacture of the "safety fuse," but which, for the greater part, are variously depreciated. I forbear enumerating any of them, for so doing would have the appearance of invidiousness; and my only wish is to see patronage extended, independently of a selfish interest, to the most useful article.—SPECTATOR: Redruth, Oct. 29.

## THE SMELTER AND MINER—THE FLINTSHIRE ORE.

SIR,—The Flintshire ore is only bid for at most by four smelters, and very frequently not at all by one or two of the four mentioned, giving a very great advantage to smelters over miners. Again, they will dictate to miners, and say we will not bid for less than 10 tons, the rest we will buy by private treaty, where we shall have no competition, but take it at our own price. Miners! why stand this, when the course before you is so open and clear? You only have the right of saying, you offer your property on certain conditions, let the smelter bid or not. The Flintshire smelters may keep you under their thumb if you submit. Why not meet them fearlessly and boldly, by taking the biddings of all the smelters in the kingdom, as by far the greater number of mines are now doing. If you will do this, as a smelter, I have reason to believe that you will have the full support of all the smelters out of Flintshire, and have their constant and fair biddings for all the ore you may, from time to time, have to offer.

Holwell, Oct. 30.

A SMELTER.

## IRON AND CARBON.

SIR,—I am glad to notice that the discussion of a most interesting subject—viz.: the habitudes of iron with carbon—has been resumed by your talented correspondents, Mr. Mitchell and Mr. David Mushet. I have been expecting for some time that a close investigation into the compounds of iron and carbon would ultimately clear up much that has hitherto been regarded as mysterious and paradoxical in the working and properties of iron. Circumstances led me to entertain the idea, that in the compound termed "cinder," carbon, in the peculiar form of graphite, was frequently mistaken for silica; and that cinder in general was a compound of iron, oxygen, and carbon, in varying proportions. My attention was once directed to a quantity of thin plates of iron, found near the bottom of the clamps, in which blackband iron ore had been calcined, at the Hirwain Iron Works. The mode in which these plates had been formed appeared to be quite clear. The subject has been lately recalled to my mind by the discovery of some very rich blackband in this valley, and I have satisfied myself that my theory was correct, by a few trifling experiments. Other occupations at present prevent my going on with these to such an extent as I consider would warrant me in publishing the results; but I hope soon to be in a position to do so. Having heard that some extraordinary beds of blackband iron ore have just been found near Glasgow, I would feel obliged if you or any of your correspondents can give any information as to the extent of these recent discoveries.

Cwm Amman, Oct. 30.

T. H. LEIGHTON.

## IRON AND CARBON.

SIR,—It may prove not uninteresting to apply further the principles enunciated in Mr. Mitchell's last communication to some of the practical details of the iron manufacture. As a first instance, let us examine the diametrically opposite modes of working the blast-furnace in the Welsh and Staffordshire districts. The Welsh keeper has his dam lower by some inches than the level of the tuyères. He has a constant flame playing under the tymph, and in the face of this, as far as mortality can endure, he carries on a desultory working of the bottom, allowing the cinder to flow as it may. The Staffordshire keeper, on the reverse, has his dam at a level higher than the tuyères; he permits no cinder to flow over for two or three hours after casting; by having a dark tymph, he is enabled to bestow the most assiduous constant labour during the whole period in raising every particle of agglutinated matter up to the action of the blast, so that nothing but what is liquid shall approach the bottom; and when this diligent attention has entirely filled the hearth with fluid cinder, rising to a higher level than the tuyères, so that the blast blows into it, he not before remits his exertions, and suffers the cinder to flow. He asserts, and by experience I know the assertion is correct, that this mode of working yields a larger make of iron from the same weight of coal. Here are two processes, distinctly different, pursued without the least knowledge on the part of the operator. What are the principles which rule his results? Topical causes undoubtedly have compelled Staffordshire to discover a process more perfect than that which Wales can afford to be contented with. Here, as in the whole circle of the arts, Nature has wisely provided that a shrewd attention to her effects will produce the most perfect results, though in perfect ignorance of her secret laws. Hence the warfare betwixt the man of practice and science, and very often to the advantage of the former; for it is easier to see than to reason, and especially with correctness, on subtle premises. What then is the principle of these two methods? The make of a furnace must obviously depend on the quantity of liquefaction obtained from a given bulk of fuel. If then, as Mr. Mitchell states, the melting region (more or less) is limited to an extent of 1 foot from the tuyères, how important must it be to economise this trifling range?

But, on the contrary, it is plain, if the dam is 3 or 4 inches below the tuyères, the combustion in this space is *wasting* its heat upon materials which have been already melted above the tuyères. In addition to this, the carbonic acid formed in these 3 or 4 in. of depth passes immediately through the upper part of the melting region, and on its transformation there to carbonic oxide absorbs a large volume of heat in the very quarter where it is most needed; add to which, that carbonic acid gas greatly impedes combustion. At ordinary temperatures, a mixture of four-fifths of carbonic acid with the atmosphere destroys the combustive power of its oxygen, and a lamp is extinguished in such a compound. I do not suppose, that at the temperature of a blast-furnace the same degree of extingutive power is maintained, but it must undoubtedly be very detrimental to pass a quantity of carbonic acid gas directly through the supply of fresh oxygen entering the furnace. I attribute to the agency of these united cooling elements the dark hollow tuyères which used to prevail at Welsh cold-blast furnaces, a constant chilling influence being intermingled in the very focus of combustion. Compare with this the Staffordshire manipulation. Unremitting assiduity is used to fill the hearth high with liquid cinder, so that no combustion can possibly take place below the level of the tuyères—the blast, supported by an elastic bed of resistance, springs upwards only. Fusion takes place in one concentrated focus above the tuyères, and the oxygen having received its first chemical change, passes at once to the next region to receive its second cooling transformation, at a point where that diminution of heat is less injurious. Each operation is preserved in its full integrity without any conflicting agencies, and the oxide of carbon is, therefore, carried hotter to a higher elevation, to effect a more rapid deoxidation, for the supply of the more rapid reduction going on beneath. The more the heat is carried upwards, the less will be the fuel uselessly consumed.

So strong is the attachment to custom, that I have heard the Staffordshire method censured as the *contrivance of idleness*. "They don't work the furnace after the first, they leave it all to the blast," which is, in fact, the highest encomium on its perfection. Its object is to remove, as soon as possible, all impediments which the construction of the furnace can offer to the full efficacy of the blast. Fire proof as Welshmen are, it is absolutely impossible to work for three hours unceasingly in front of a flaming tymph. Thus the imperfect process re-acts, and compels also an imperfect and desultory labour. It is quite unnecessary to feel, throughout a turn, for lumps in the bottom of a hearth filled high with liquid cinder. The blast, which sweeps across this molten surface, leaves very little chance for unqualified accumulations to sink to, or through it. I have heard it urged, that the low dam, and the flame forward, are absolutely required by the colder nature of Welsh materials. It is true, the minerals are quite as opposite in their nature as the practices of the two districts—a Welsh bottom growing up with grey-iron, and the Staffordshire with

white. But I do not believe the objection is sound. If, for foundry iron, the hearth must be more shallow, the cinder may still be kept high; with forge iron, the very ground of the objection fails. That the flame forward is a loss of blast, there can be no question. I think there is nothing more serious than custom (and that is serious enough) in the way of an improvement. It is not long since I saw the high dam introduced by a Welsh ironmaster, who has for nearly half a century taken the lead in applying to his manufacture the improvements of science, and, I understood, with corresponding advantage of make. This I can assert from my own experience—that with infusible and refractory materials the Welsh process proves a total failure; whilst all difficulties vanish with the use of the other method; and I cannot doubt, both from observation and the theory, that it would in all cases increase the make of iron.

To carry further the explanation I last week suggested of the blisters upon steel, it is a possible supposition that the liberated oxygen, passing out and recombining with carbon in its passage, may, in addition to the other causes, have its escape impeded by the chill imparted to those lamina, where it has absorbed the last equivalent of carbon.

October 29.

DAVID MUSHET.

## STEAM-BOILERS—MR. HORSLEY'S PATENT.

SIR,—I am glad to see Mr. John Horsley's specification; it is on the right principle. All chemical means to prevent deposit, by keeping the salts suspended in the boiler, are essentially erroneous, making but an exchange of evils, and often for the worse. I only hope Mr. Horsley may bring his processes to that plain routine absolutely necessary for the rough habits of those that will have to execute them. There are waters which Nature brings to the surface totally free from the salts which produce deposition; and unquestionably art, by the use of chemical re-agents, may purify any water to the same degree; and to perform this before the water enters the boiler is their only rational application; but it will be a great difficulty in ordinary use to manage the nice balance of saturation and precipitation. Ordinary workmen are the mere servants of necessity, and cannot be trusted with critical processes. A newspaper correspondent lately offered a suggestion, the fruit of his own experience, on the current smoke question. Stating what we all know, that a great part of the nuisance may be abated by attentive firing, he added it was his habit to make his fireman a weekly allowance, on the condition he should be answerable for all smoke fines. This gives a motive for that minute care which is irksome to a workman's habits. He prefers, when he is at it, throwing in plenty of coal to take its chance till the next time; the more he throws, the longer his interval. The "opaque smoke" which, if it baffled Legislative definition, is at least visible, and that in a moment is an immediate register of neglect; but it will be very difficult to impose such a ready check on any neglect of the delicate processes involved in Mr. Horsley's patent. I have every wish for his success, which indeed I may, as I should be materially assisted in processes of my own; and I may, therefore, the more remark on the greatest obstacle in his path.

The two chief evils in land engines are the incrustations of lime, and the presence of acids in mineral waters, which have filtered through decomposing iron pyrites in collieries, and sulphures of copper, tin, &c., in metallic mines, producing not deposition, but corrosion. As a rough cheap method of correcting the first of these, I have found few waters in which a few drops of sulphuric acid to the gallon would not throw down a copious milky precipitate of sulphate of lime, so as greatly to relieve the boiler. And, in the second case, I have effectually neutralised the acidulated water of colliery wastes, by passing it over a surface of lime rubbish. But even here nice adjustment is required to prevent excess, and avoid the cure producing its opposite disease of acidulated or lime water. It is said, that caustic lime is only soluble in water, but all water passing through or over carbonate of lime contains a large quantity suspended, from which the ordinary scum is formed. Baryt is, therefore, undoubtedly a better neutraliser, and its weight is a mechanical advantage, and it is fortunately at hand in most mines of metallic sulphurets. Fully approving of the principle on which Mr. Horsley proceeds, I trust he may be able to establish such a stringent array of tanks, reservoirs, filters, &c., as may neutralise all opposing agencies.—DAVID MUSHET: Oct. 29.

## RAILWAYS—THE STOCK EXCHANGE.

SIR,—It has been a question long mooted by a numerous body of shareholders, representing a very large capital invested in railways, that at present they are completely at the mercy of the Stock Exchange. This monopoly, with doors closed against the public, contrary to the practice of other commercial associations, but too often arbitrarily dictates the prices of railway shares as it may suit the interests of many of its members. Under these circumstances, allow me to suggest, Sir, that it behoves the numerous body representing the vast capital invested in railway and other stocks to lose no time in uniting, by personal energies and by subscribing the small amount of money it may require, to obtain an open market, either by throwing open the doors of the present Stock Exchange, or by founding, on good and sound principles, a new public stock and share market.

Devonshire-square, Oct. 31.

JUSTITIA.

## WONDERS IN LOCOMOTION—NEW MOTIVE POWER.

SIR,—Several papers appeared in your Journal, in April last, under this attractive title. Can any of your readers give any information as to whether the experiments therein mentioned have been carried out to any successful practical result; and if a carriage of any kind, fitted up in the manner mentioned, for propulsion on common roads, can anywhere be seen? Albert-street, Regent's-park, October 29.

D. B.

## VENTILATION OF MINES—MR. C. COLWELL'S SYSTEM.

SIR,—I purpose devoting this letter to an examination of Mr. C. Colwell's suggestions for the better ventilation of coal mines. I must apologise for intruding so largely on your valuable space; but as my object is to enumerate what appear to me to be objections, and not to commence a discussion, for which I have neither time nor inclination, I am anxious to review at once all the most prominent features of the communications in question. The present is an era of superlative quackery. We have quack physicians, who profess, with their single nostrum, to eradicate all diseases that have baffled the efforts of men really eminent for their hard-earned knowledge or therapeutic skill; quack politicians, who would set aside the experience of ages in favour of their own cherished ideas; and quack ventilators, who would fain persuade us that the results of the accumulated observations and researches of men of science hitherto are all wrong; and that they alone, by one single essay of their gigantic intellect, have overstepped all those progressive demonstrations which have hitherto been considered necessary in order to arrive at truth, and have reached the summit, without any of that patient investigation of Nature's phenomena and laws which inferior minds would consider an indispensable prelude to the exercise of their inventive powers.

Allow me to correct an impression which Mr. Colwell endeavours to propagate, as to the general disinclination of the managers of mines to listen to suggestions made by men who are deficient in practical knowledge. This entirely depends upon the circumstances under which such suggestions are introduced to their notice. There are certain requisites to be fulfilled in every scheme before it becomes entitled to attention.—1. The scheme itself must neither be egregiously foolish nor obviously inapplicable.—2. The inventor must not be puffed up with self-conceit, or forget to use such language as the courtesies of society demand.—3. There must be a strict adherence to truth in every assertion made. Mr. Colwell having neglected to comply with any of these conditions, must be content to bear the consequences ensuing.

Our first impulse on any striking or peculiar invention being brought under our notice, leads us to inquire, what are the causes that led to the discovery; and what the sources from which the projector's information is derived? We shall have no difficulty in satisfying our curiosity on this point in the present case. Every reader of the *Mining Journal* is acquainted with the fact, that Mr. C. Colwell is in possession of the *Report of the Select Committee on Accidents in Mines, 1835*. From the mutilated fragments of this report all his communications are made up. It is quoted and misquoted, sometimes with, and sometimes without, acknowledgment, to an unlimited extent. One striking instance of the latter species of "borrowing" occurs in the letter of October 4th, where he dilates largely upon the unscientific mode of re-lighting furnaces when extinguished. This he states to be performed, by slipping a red-hot ring down a string tied to the bar of the furnace, which is previously charged with tar and various combustibles. I had some difficulty in finding the authority for such an outlandish and primitive method; but at length, on referring to the report, I found it abstracted from Mr. Buddle's evidence, relative to the methods formerly adopted, and immediately followed by these words:—"This system was the only one we knew of, and the only one that was



pursued up to about the year 1807, I believe." Many similar instances of perversion of evidence might be brought forward. I had indeed prepared a list of the most glaring; but this letter would be too much extended by their quotation—"Es uno diace omnes."

There is something singularly chameleon-like in the scheme itself. It appears to change its character continually, and to become every week more and more enveloped in a mist of pseudo-philanthropy. The only communication in which Mr. Colwell has favoured us with specific details of his plan is that of July 25th, from which I extract the following explanation:—"Supposing the current of air to be passing from north to south, mixed, as it will of necessity be, with a portion of hydrogen and carbon; at the south end of such drift, and facing the drift, I would excavate beyond the present footway, so as to form a cell—the measurement of which is to be hereafter determined; the roof to be carried up beyond the level of such driftway—for instance, in the form of an umbrella—and the bottom to be carried below the level of the thill, like an umbrella inverted. This cell to be divided midway, if practicable, and bricked up again in front; but an aperture to be left the width of the drift in a line with the present roof, so as to catch the floating hydrogen rising upon the atmospheric air in its course, and a similar aperture in a line with the thill to the wall beneath to catch the carbon—both of which by such means will, I apprehend, detach themselves from the pure air, and become lodged in the trap thus prepared for their reception; while the atmospheric air thus cleansed, and coming in contact with the wall between these apertures, will pass on to the adjoining drift. I propose that a similar cell should be made at the north end of another driftway, in which the current of air is propelled from the south," and so on. "To repeat these foul air cells wherever needed for a similar purpose," "by which means, the air would become purified, increased in quantity, as I will show, and the danger removed." "These foul air cells to be connected with one main, to be fixed in the side of the centre of the roadway, to guard against damage from the falling in of the roof, or rising of the thill. The branch pipes to the foul air cells to be fitted with stop-cocks, similar to gas-fittings, so that few or many of them could be acted upon at one time. The upper branch to communicate with the highest point of each cell for the removal of hydrogen and other light bodies; and the lower branch to the lowest part of the cells for carbon—either of which dangerous elements, by means of an air-pump, &c., could, I apprehend, be removed at pleasure by the upcast without passing the furnace, regulated, as I before said, with stop-cocks." The rationale of this scheme is expressed in the following assumptions from the same letter:—"I will now assume—1. That the carburetted hydrogen is lighter than atmospheric air; and, consequently, driven along the drifts on the top of the latter.—2. That carbonic acid is the heavier of the three; and, consequently, slowly propelled along the thill, or footway.—3. That the atmospheric air, of necessity, takes the middle course.—4. That whatever quantity of air may be obtained at the downcast shaft, cannot be proportionately carried throughout the whole course; and even if this could be accomplished, I verily believe it would only abate, but not remedy, the evil."

I have stated these propositions in full, because I mean to deny them all; from first to last they are untrue. To substantiate so unqualified an assertion, it will perhaps be necessary for me to produce some authority beyond my individual experience on which this denial is grounded. I, therefore, select such as appear to me to put the matter in the plainest light:—"All gases, when under existing circumstances they do not enter into chemical combination, yet diffuse themselves through one another, and form a uniform mixture, though their specific gravities may be very different, and they may be kept externally at perfect rest. If, for example, two bottles be connected by an upright glass tube, 10 in. long, and 1-20th of an inch wide, the upper bottle being filled with hydrogen, nitrogen, binoxide of nitrogen, or common air, and the lower with the heavier gas (carbonic acid), or the upper with hydrogen, and the lower with common air, nitrogen, oxygen, or binoxide of nitrogen, a portion of the heavier gas will, after a few hours, be found in the upper bottle; and after two or three days, both bottles will contain the two gases in the same proportion. (Dalton's *Philosophical Magazine*, vol. 24, p. 8). The same result was obtained by Berthollet (*Mémoires d'Arcueil*, vol. 2, p. 463) with a tube, 10 in. long, and one-fifth of an inch wide, placed in a cellar where no change of temperature could take place to set the gases in motion. When different elastic fluids have once diffused themselves uniformly through one another, they never separate again, according to their different specific gravities, for however long a time the mixture may be left at rest; this was long ago shown by Priestley" (*Gmelin's Chemistry*). According to experiments of Prof. Graham, if a cylinder, filled with carburetted hydrogen, be placed in a horizontal position, and made to communicate with the external air by means of a tube, with the end directed downwards, in four hours 4/5 of the gas will have disappeared, and its place be occupied by atmospheric air. That this holds good in the operations of Nature, as well as in the laboratory of the chemist, is sufficiently obvious. Sansure and Gay Lussac found the usual portion of carbonic acid in air taken from the summit of Mount Blanc. Humboldt detected it in air brought from a height of several thousand feet in a balloon. It is unnecessary to multiply authorities for an universally acknowledged fact. The same property of diffusion may be found explained in all the elementary works on the general science of chemistry—Brande, Turner, Gregory, &c.

If this law operates when the gases are in perfect rest, much more then will it be true when, as in coal mines, the air is in constant agitation from the various turnings and windings of its course, the passage of men, horses, and trams through the middle of the current, and the obstructions it meets with from the alternate contraction or expansion of area, and the inequalities on the sides, roof, and thill of the airway. In this case, the gases are not merely brought in contact with the air in large volumes, and left to diffuse themselves by their natural tendency, but being extricated, as a general rule, in minute portions from the whole of the exposed surfaces, are at the time of such extrication mixed immediately with the atmospheric current. Few coal seams generating carbonic acid contain any large proportion of fire-damp; but there is always a greater or less quantity of the former present, as the product of combustion or respiration. A mixture of one part of carbonic acid, with five of atmospheric air, will extinguish flame; therefore, according to Mr. Colwell's theory, we should only have to hold a candle at the bottom of the air-course to produce its immediate extinction. The experiment is sufficiently easy; let it be tried. If the hypothesis of Mr. Colwell were true, no coal work could be carried on at all in the same manner as at present. In every part of the workings, in the slightest degree elevated above the level of the roof of the air-way, there would necessarily be a collection of carburetted hydrogen; while in every part below the level of the thill, or floor, of the air-way, would be a stratum of carbonic acid; so that throughout the whole mine there would be a middle stratum of air at the exact level of the air-course; and the workings to the rise or dip of the current become reservoirs, from which the gases would run over as fast as generated—the action of gravity tending constantly to equalise their level. The proposition is evidently absurd to a degree, and opposed to the simplest facts of every-day experience. A candle taken into a return air-course indicates, by its long, dull, brown cap, the intimate mixture of carburetted hydrogen, carbonic acid, and atmospheric air, which, in ordinary circumstances, does not vary in the upper, middle, or bottom part of the air-way. I have known 70 yards of headway driven to the rise, in a seam evolving fire-damp, without any artificial means of ventilation at all, and that without the use of the safety-lamp. This would be impossible if the gases took the position due to their relative gravity.

It may be urged, that notwithstanding the tendency of gases to diffuse themselves among each other, collections of fire-damp are found to exist in the tops of goaves, old workings, &c., in mines where there is no current to carry them off. To this I reply, that in all such cases the gas has either been produced from accidental causes, as a sudden evolution or change in the barometrical state of the atmosphere, or is naturally evolved faster than the tendency to diffusion can distribute it. In such cases there may be an influx of a highly explosive mixture from any of these old goaves, and this is the danger—to diminish which the efforts of inventors should be directed. At an examination of the goaves in Haswell Colliery, shortly after the explosion in 1844, "no gas was detected in any of the 14 goaves, even up to heights extending from 5 to 14 ft. above the top of the coal seam at the highest edges of the several goaves." This applies equally to the smaller collections of gas, which are sometimes found in holes, or undulations, of the roof, when out of contact with the air-course. If a glass jar of carburetted hydrogen is inverted in such a situation, in the course of a few hours the gas will have mixed itself with the atmosphere from below. In the one instance, there is a constant supply coming out from the roof to make up whatever loss may take place, and it, therefore, remains sensibly the same; in the other, a fresh supply is prevented by the glass, and the effect of diffusion is more appreciable.

The fact of explosions occurring at all, affords additional proof that carburetted hydrogen does not exist for any length of time in mines without diffusing itself throughout the surrounding atmosphere. The gas itself will not support combustion, in simple contact with the air; it will only burn as a flame; mix it, introduce oxygen among its atoms, and it becomes violently explosive.

We have dealt hitherto with the letter of 24th July—being the only one containing any specific description of the improvements contemplated. This, Mr. Colwell has since deemed it necessary to qualify in such a manner as entirely to change the aspect of his scheme. In the letter of Aug. 22d, he is far more modest—"I am fully aware that the gases and the air are blended together; and that they do not perfectly subside into layers, according with the specific gravity of each. Still I know their natural tendency to be as I have described; and that in some mines the carbon can be caught by holding a jug near the thill, and all admit that the hydrogen preponderates nearest the roof; it, therefore, appears to me reasonable to expect that a great proportion of these fatal gases would detach themselves from the atmospheric air, and become drifted into these cells."

Let any one contrast even this with the fundamental assumptions quoted above, on which the whole scheme is founded, or with the vivid description of the "floating hydrogen rising on the atmospheric air in its course." Is it to be supposed, that when Mr. Colwell affirmed that the air would be "increased in quantity," he contemplated the removal of the gases and the air "blended together?"—or imagined, that by taking away a portion of air from the current, he would increase the remainder? Or even admitting this amended reading, and that the carburetted hydrogen has a tendency to preponderate nearest the roof, and to pass, mixed with its variable proportion of atmospheric air, into the "trap" prepared for its reception; this tendency would be entirely counteracted by the agitation consequent on the impingement of the atmospheric column, moving at a rate of 2 ft. or 3 ft. per second against the breast-work, which is to turn the current into another course. If we try the experiment on water, which is by far the less elastic fluid, we find that it rebounds upwards and downwards from the opposing body, in proportion to the length of the column multiplied by its velocity. Much more, then, would it do this, when, as in these gas cells, immediately above and below the opposing body or breast-work there exists a way of escape, not merely open, but with an absolute current already setting towards it. I will venture to affirm, that if the experiment were tried, Mr. Colwell would not only not obtain that portion of the atmospheric air which had floated nearest the roof in the regular air-course, but would obtain some other portion which, holding a position lower down, would first impinge against the upper part of the breast-work, and being by the impulse of the current behind forced upwards, with an increase of density due to the momentum of the moving column acting upon it, would prevent the approach of the lighter column at the top of the air-course, which, from its friction against the roof, and greater rarity, necessarily moves with less velocity, and has less momentum than the middle portion. Mr. Colwell proceeds, "if it requires 14 ft. of air to one of carburetted hydrogen to dilute it below explosive point, I consider every foot of this gas stopped in its course, equal to an increase at the down shaft of 14 feet of air." Now, in order to view the question more fully, we will put aside for the moment all considerations detailed above, and consider this assertion separately. "The gases and the air, he is fully aware, are blended together." I will assume also, which, indeed, requires no proof, that in no regular air-course of the whole coal workings is the carburetted hydrogen mixed with so small a proportion of atmospheric air as to form an inflammable mixture; that proportion must, therefore, by some indefinite quantity or other, exceed 14 ft. to one of gas. It follows that, on Mr. Colwell's system, for every foot of gas so removed, 14 feet of atmospheric air are abstracted from the air-course, as well as some other variable quantity existing in the mixture, above what is sufficient to dilute it below the explosive point—a quantity in almost all cases equal to more than as much more. To put the argument in a familiar manner, we remove a portion of acid; but, at the same time, we remove also a sufficient portion of alkali to neutralise it, as well as some other portion in excess of what is required for our purpose, and which would be efficient in neutralising another portion of the acid.

I have endeavoured to view this scheme apart from the practical difficulty surrounding it, as these difficulties can only be duly appreciated by practical men. I will state, however, that if the principles were good, and the assumptions on which it rests undeniable, I have never yet seen a coal mine where the expense of putting it together, and keeping it in operation, would not preclude all possibility of working the coal at a remunerative profit. The heaving of the thill or floor, the falling of the roof in large quantities, the falling in of the sides, and all the numerous accidents to which mines are liable, would render it impossible, at any reasonable cost, to keep a long system of pipes in repair, or gas-tight. All these accidents increase in number and extent as the coal is worked out. In the report on the explosion at Haswell Colliery, 1844, Messrs. Lyell and Faraday recommended the adoption of cast-iron pipes, to clear the goaves or old workings only. A select committee was appointed by the committee of the coal trade at Newcastle, to take into consideration, and report upon this plan. They found that, "to carry out at the Haswell Colliery the first plan proposed—that of conducting the gaseous contents of the goaves to the upcast shaft by means of cast-iron pipes, 12 in. in diameter, and 3 in. thick in the shell—would require rather more than 12 miles of pipes, and would cost, including the putting of the latter together, about 21,000*l.*, if not considerably more—perhaps even double this sum, considering the difficulty of laying down such a length of pipes in the workings of a mine, and the unprecedented nature of the operation."—"It may likewise be apprehended, that to keep such long ranges of pipes in thorough repair and airtight, would not only be most troublesome and expensive, but scarcely, they believe, practicable." This, then, is the opinion of men well qualified to judge, and selected for their known experience and intimate knowledge of the subject, on the far less difficult and expensive application of pipes for the ventilating of goaves alone. In this case, there would be main lines of pipes only, direct to the shaft; these lines would be stationary, and being once laid down, would merely require to be kept in repair. In Mr. Colwell's plan there must be ramifications throughout the whole mine; wherever coal was wrought, there also must be ranges of pipes laid down. These pipes would not be permanently fixed, but require to be constantly taken up and relaid, to accommodate themselves to the changes of the air-course. In the former case we might, to a certain extent, guard against accidents, as the ranges would pass almost altogether along the main driftways; in the latter, they would extend through nearly all the working boards, headings, or drifts of the mine, which cannot be kept in the same efficient state of repair, and are, therefore, far more liable to accident—in short, admitting the practicability through extreme difficulty of the former plan, the latter, from its increased length, increased expense of laying down, the vastly increased cost of keeping in repair, and continual extension or alteration, with the additional expense of the erection of gas cells to suit with every change, and the "stop cocks similar to gas fittings," would be inevitably ruinous to whatever coal mine it was adopted in. I am throughout supposing the most favourable circumstances for the development of Mr. Colwell's plan; though more than three-fourths of the coal mines of the kingdom are wrought either on the long wall, or post and stall systems, in either of which it would be absolutely impossible to keep the gas cells facing the air-course, while the work was in progress.

It cannot be supposed that, in the production of their report, the coal trade committee were actuated by personal ill-will towards Messrs. Lyell and Faraday; but rather, that with the confidence of men who were conscious that the extent of their previous knowledge and experience rendered them perfectly competent to form an opinion; and with the most deliberate conviction of the impracticability of the system recommended, they objected to it as being unsuited to the end proposed. If in this instance they were actuated by an unworthy hostility to the propositions of persons not interested in the coal trade, I can only say, that it is contrary to all our previous experience; that heretofore they have always shown themselves ready rather to reward inventions than to condemn; and that the adoption of the latter course would be so obviously contrary to their own interest, that, at the same time as we assert such to have been their conduct, we leave a natural inference that they must, at that period, have been bereft of what is usually called "common sense."

I would remind Mr. Colwell, that a mere reiteration of the fact that he has laid his plan before Her Majesty's Secretary of State for the Home Department, which he has already informed us of three several times, is no argument in its favour. Any scheme—the simplest or most ignorant—may do the same thing. Poor Sir George Grey! I have no doubt there are a hundred Mr. C. Colwells offering him advice or assistance at this present time; each believing, on his soul and conscience, that his individual scheme is the only one really applicable to the complete and entire removal of all danger in the working of coal mines.

Infinitely cool is the nonchalance with which Mr. Colwell throws experience overboard. "The subject has been too long confined to one class of the scientific world, who are evidently unable to keep pace with the times of improvement." He expects no improvement from men whose intellects have been dulled by practice; so he calls on the members of all other professions to try their hands. If we are to judge from the miserable ignorance of first principles which his own scheme displays, we have nothing to hope from the invitation. By the same reasoning, the most likely man to improve a locomotive engine would be one who had no more knowledge of the manufacture of such engines than a casual visit to some fitting shop might have afforded; or, if you educate a man for a lawyer, it is highly probable he will make important discoveries in chemistry; or, if you wish to be cured of an inveterate disease, it will be far better to apply to some quack pretender, than to a well-skilled physician. To me these anomalies appear absurd. I am no believer in accidental discoveries; by far the greater portion of what are represented to be such, will be found on examination to depend on facts accumulated beforehand; and when we place the discoveries of reason and practical experience side by side with those of accident, the latter sink into insignificance in point of number.

The splendid discovery of Sir Humphrey Davy is adduced as a proof that invention does not follow in the train of experience. No instance could be more unfortunate. The production of his safety-lamp, is to be attributed solely to the intimate knowledge of the phenomena and properties of gaseous fluids which this extraordinary man possessed—a knowledge gained only by long previous study, and repeated experiments and observations. Already in the zenith of his fame, and distinguished by a genius for research, the most powerful of the age, Sir Humphrey Davy possessed, at the period of his invitation to the north, every requisite for the performance of the strictly philosophical process which led to such grand results. The discovery of the safety-lamp was one of the purest inductions. Davy conducted his inquiry by a long train of elaborate experiments. Step by step he proceeded; first, to determine the proportion of carburetted hydrogen and atmospheric air which formed the most explosive mixture; secondly, at what temperature such a mixture would explode; thirdly, the effect of radiation from metallic surfaces in keeping such surfaces at a temperature below that required to produce explosion; lastly, he observed, that in small tubes the whole space enclosed by their circumference is deprived of heat so rapidly to supply this radiation, that the temperature is lowered below the degree at which gaseous matter is luminous, and that this fact is true, without reference to the length of the tubes; and, consequently, arrived at the conclusion, that wire gauze, of sufficient fineness, being nothing but a series of tubes, will prevent the passage of flame. Here was no visionary or uncertain hypothesis; no assumptions of things that were not; but a legitimate conclusion from established facts. Turn from this to the case which it is intended to justify: Mr. C. Colwell is seized with a mania for ventilation, whether philanthropic or otherwise I will not inquire. Possessed of no other qualification than the questionable one of having a mind perfectly empty of all knowledge on the subject, he obtains the report of 1835, makes a journey to the north, goes down two or three pits, and then comes back in the plenitude of his wisdom, to tell us that mining hitherto has been conducted upon erroneous principles; that the system which Spedding, Buddle, Taylor, Stevenson, and a hundred other men of genius, have laboured to improve, is totally inefficient, and that he (Mr. C. Colwell) has, in his transitory visit to the north, discovered that grand desideratum which men of scientific and practical knowledge have alike believed attainable. I suppose the next excursion of this gentleman will be a voyage across the Channel; and the result produced a new system of navigation, by which shipwreck, and all other accidents, will, in future, be totally prevented.

I observe, in Mr. Colwell's last communication, that he recommends the formation of an enormous "artificial swilley" at the bottom of the upcast shaft, to separate the gases from the return air. In my humble opinion, the best thing to be done with vitiated air, when it has arrived so far on its course, is to get it up the shaft as soon as possible. In no well-ventilated colliery are the means wanting to remove all air too highly impregnated with gas from the main air-course, and convey it by a separate drift to the surface, without bringing it into contact with the furnace. I have never heard of a single accident from explosion at the furnace, in a well-managed colliery, which might not be traced to individual neglect, and if accidents produced from carelessness are to be classed as due to the defects of a system, we may as well blame the chart, or call for a new system of navigation, because a careless pilot runs the ship aground.

Of one thing I am convinced. The furious zeal of amateur ventilators will never be productive of good. Useful inventions never spring from such sources. It is from my brother miners of England, or from scientific men, who will confine their suggestions within the limits of scientific inquiry, that improvement must come. It is on the caution, the watchfulness, and the efficient education of the former class, that the safety of the lives entrusted to their care must mainly depend. Deeply impressed, as I am, with the importance of this charge, I cannot but strongly urge upon their attention the truth, that however good may be the system of ventilation, however efficient if properly carried out, the slightest relaxation of their exertions, or the simple deferring to the morrow what should be done to-day, may render the most skillful or scientific arrangements of no avail.

Abercrombie, Oct. 24.

J. R.

#### ON THE GENERAL SYSTEM OF ATMOSPHERIC TRACTION.

SIR,—Amongst other objections brought forward by Mr. Carr against the atmospheric principle of railway propulsion was one to the following effect:—viz. that it was necessary the power exerted on the steam-piston must exceed the resistance on the air-piston at the end of the stroke of the air-pump—that all excess of power on the steam-piston during the first part of the stroke, or would be wasted, and, consequently, to adopt the expansive principle, instead of diminishing, would only increase that waste. I had fully expected that Mr. Baggs would have refuted such an absurd objection, and can only account for the omission on the score of its being too ridiculously absurd to require a refutation; but as it would appear that the absurdity of Mr. Carr's conclusions has not been sufficiently apparent to preclude some of your scientific readers from concluding that, because he is in the habit of making a "flourish of figures," he must necessarily be a competent authority on such questions, I feel it my duty, being interested in the subject, to direct the attention of those gentlemen to the errors referred to.—JOHN WESTON, Oct. 28.

FALL OF ARCHES ON THE EAST LANCASHIRE RAILWAY.—Mr. S. Meek, the resident engineer of this railway, in reference to the accident noticed in the *Journal*, last week, says—"I have examined the works, and find that the accident is not to be attributed to any fault in the execution of the fallen portion of the viaduct, but to the sub-contractors having, in the absence of authority, withdrawn the centres from some of the arches before the mortar was properly set; the effect of the late heavy rains upon which has been to bring them down, together with others on each side of them. There has been no loss of life or accident to any person in connection with the fall of these arches."

RECLAMATION OF LAND FROM RIVERS.—The Lords Commissioners of Woods and Forests have served notices requiring the land taken in from the river by the Cork, Blackrock, and Passage Railway Company, and they have written to say that a valuator is instructed to come over and value the property for their lordships. The Corporation of Liverpool, within a few days, completed a compromise with the Commissioners of Woods and Forests, by consenting to pay to the credit of their lordships a sum of 160,000*l.* for land they took in from the river.—*Cork Constitution*.

INDIA RIVER STEAM NAVIGATION.—The opening of the rivers of India to steam navigation is exciting a deep interest throughout the country; until railroads can be established, it is felt that the only way of opening our vast Indian possessions, and rendering our late conquests available for commerce, is by means of steam communication on the rivers and its tributaries. The great cotton districts are comparatively lost to this country; for want of roads to convey the produce to the shipping ports; and the only means at present within our reach is to adopt some sort of vessel suited to the shallow and changeable nature of the navigation. The plan proposed by Mr. Bourne, which has been for some time before the public, seems to be generally approved of—it was described by us some time since at length. It may be remembered that a committee of gentlemen in London had associated themselves for the purpose of carrying out a comprehensive scheme on this principle, and had applied to the Honourable Court of Directors for a charter, limiting responsibility to subscribers, and for a bonus in the event of the experiment proving successful. This application was supported by a petition from the Glasgow Chamber of Commerce, and we now allude to the subject again for the purpose of noticing a memorial from the Chamber of Commerce at Manchester, and also one from Aberdeen, signed by the principal merchants and manufacturers of that city, who had formed themselves into a committee for the purpose of petitioning the India House in favour of the prayer of the London committee. The honourable directors will, no doubt, give the matter their most serious consideration, seeing that it is so fully supported by the manufacturing and shipping interest of Great Britain.—*Morning Chronicle*.

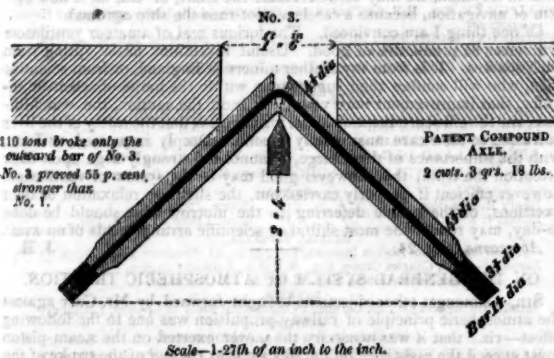
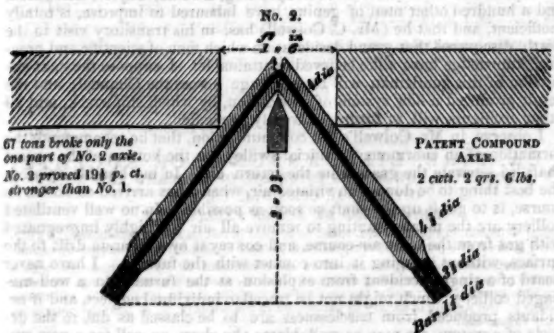
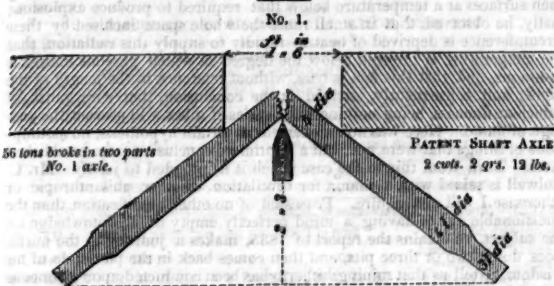


## RAILWAY AXLES.

Sir,—With reference to the charge made against the Shrewsbury and Birmingham directors by Mr. Geach, that in ordering the axles they were actuated by improper motives, without regard to the public safety, I feel, in justice to myself and my co-directors, that I should publish the proofs by which we were guided in the selection of the axles to be used, and leave the public to judge for themselves how far this charge is founded on facts. If we had made choice of the weaker axle, we might justly have been charged with want of due regard for the public safety. When the patentee set forth the superiority of the compound axle, I recommended the committee not to try one man's iron and make against another's, but to test the principle, by having one solid axle made, and one compound axle from the same quality of iron, by the same workmen, heated in the same furnace with the same quality of coal, rolled in the same rolls to the same size, and at the same time. This was done, and they were sent to the Messrs. Lloyds to be tested, from whom a certificate was returned of the result, which was as follows:—The solid one broke in two with a pressure of 78½ tons; the compound one fractured through only one-half of the hollow axle at 89½ tons, leaving the inner axle perfectly sound, which was afterwards broken by tension. Upon this proof the selection was made, and orders given out; after which Mr. Geach made his charges to our chairman, and also through the public newspapers. To further satisfy myself and the committee, I had the axle, No. 2, taken from the bulk, and drawn down to the same shape and size as the Patent Shaft one, which so altered its due proportion as to much weaken it; and, to prove this fact, I sent one out of the bulk without altering it from its due proportions; and the result fully shows the superiority of the compound principle. I am bound to say the Patent Shaft axle was as good as any solid axle can be made. All these samples, with the certificate of the test, can now be seen by any one who will call at our works and look at them.

G. B. THORNECROFT.

Shrubbery Iron-Works, Wolverhampton.



Scale—1-27th of an inch to the inch.

Some attempts having been made to cast discredit upon these proofs, we, the undersigned, have examined the samples of the compound axles, and the Patent Axle Tree Company's axles, and the certificates of Messrs. Lloyds, Fosters, and Co., who tested them, and we find that they fully bear out the statements made and published by Mr. G. B. Thorneycroft.

ROBERT BOWMAN, Engineer.  
E. T. WRIGHT, Engineer.  
JOHN DIXON, Ironmaster.  
JOSEPH FARMER, Iron Merchant.  
PHILIP HART, Manager of Iron Works.

## EXPERIMENTS ON BRIGG'S PATENT COMPOUND AXLE.

Diagram No. 1.



[Scale ½ inch to 1 foot.]

This axle was made in the peculiar form represented by diagram No. 1, in order to ascertain what effect the reduction of the axle in the centre would have on its strength, compared to an unreduced one, while under the different forces to which axles are subject when in use. Two courses of experiments were tried with this axle, the force applied being the impact of a large ram, 460 lbs., falling 11½ feet, the momentum of each blow was upwards of 5½ tons. A, A, shows the relative position of prop and ram in the first course of experiments—this position has relation to both ends (both ends were broken off, as shown in diagram No. 2); B, B, shows the relative position of prop and ram in the second course of experiments—this position has relation to both ends (both ends were bent, as shown in diagram No. 2). During both courses of experiments the axle was loaded in the centre, and on the extreme end.

Diagram No. 2.



[Scale ½ inch to 1 foot.]

## FIRST COURSE OF EXPERIMENTS ON ENDS G AND H.

End G broke off at the fourteenth blow of the ram; the deflection previous to the last blow was 154°. This end was ½th less in diameter than end H. End H broke off at the fifteenth blow of the ram; the deflection previous to the last blow was 148°. It appears, therefore, that in the strength of the two ends to resist impact, there is little or no difference—end H being ½th larger than end G.

## SECOND COURSE OF EXPERIMENTS ON ENDS E, F.

End E received 46 blows of the ram, and bent to an angle of 162°. End F received 16 blows of the ram, and bent to an angle of 157°. From the last experiments, it is very evident that, by reducing the axle in the centre, the strength to resist impact on that part where the wheels are fixed is reduced from 46 to 16—thus showing 187½ per cent. in favour of the unreduced axle.

Again, an axle of the same make was reduced to 4 inches diameter in the centre, and subjected to transverse strain, when it fractured to the inner bar with 68 tons; while an unreduced axle, of 4½ inches diameter, bore 116 tons, without the least appearance of fracture—thus showing a percentage of 70½ in favour of the unreduced axle.

Again, as the strength of axles to resist torsion is as the cubes of their diameters and velocities, then the unreduced axle is 42 per cent. stronger than the one reduced in the centre.

The weight of an axle unreduced is ..... cwt. 2 3 18  
The weight of an axle reduced is ..... 2 2 6

1 12 saving of weight; but the reduced axle being 1s. per cwt. dearer than the unreduced one, the saving in cost by using the reduced axle is but trifling.

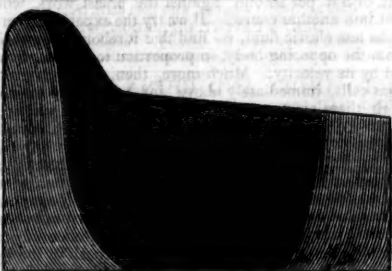
Loss of strength to resist impact ..... 187½ per cent.  
Loss of strength to resist transverse strain ..... 70½ "  
Loss of strength to resist torsion ..... 42 "

Wolverhampton, Oct. 31.

ROBERT BOWMAN, Engineer.

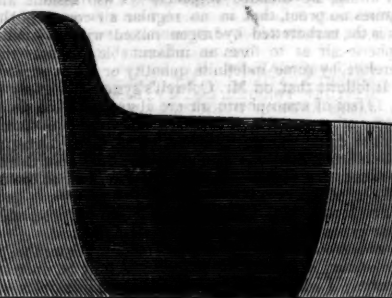
## THORNECROFT'S PATENT RAILWAY TYRES AND RAILS.

RAILWAY TYRE.—SECTION No. 1, HALF SIZE.



The middle, or wearing, part of this tyre is composed of chrysaline charcoal iron, the hardest and soundest iron made. The outward edges are made from a mixture of India charcoal pig with the toughest fibrous iron—the whole made upon an improved principle into one homogenous mass. These charcoal tyres are warranted better and more durable than any tyres made in England.

RAILWAY TYRE.—SECTION No. 2, HALF SIZE.



The middle, or wearing, part of this tyre is composed of the best refined chrysaline puddled iron. The outward edges are of the best No. 3 fibrous iron, and put together upon an improved principle into one homogenous mass. These tyres are warranted quite equal to any made in Staffordshire.

Fig. 1.

SECTION OF BRIGG'S PATENT COMPOUND AXLE.

Scale ½ inch to a foot parallel axle.

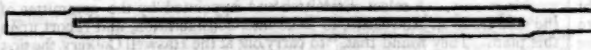
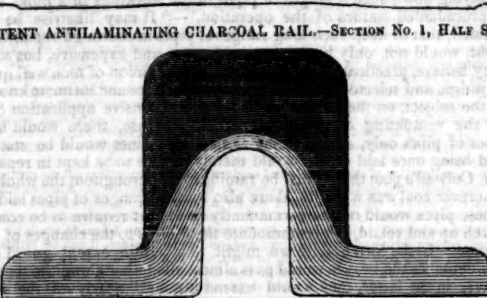


Fig. 2.

SECTION OF BRIGG'S PATENT COMPOUND AXLE.

Showing the extent to which the internal bar is welded solid at end, drawn down in the middle half an inch.

PATENT ANTIMINERATING CHARCOAL RAIL.—SECTION No. 1, HALF SIZE.



Patent antiminating rails, made from the same quality as the best 5½ iron.

The upper, or wearing, part of these two sections of rails is made from antiminating charcoal iron, much harder than any other iron, perfectly free from lamina. The under, or fibrous, part from best No. 3 puddled iron.

PATENT ANTIMINERATING CHARCOAL RAIL.—SECTION No. 2, HALF SIZE.



Patent antiminating rails, made from the same quality as the best 5½ iron.

Rails of the same sections are made from puddled iron, quite free from lamina in the wearing part, but soft and less durable than charcoal rails. This principle is applicable to any kind of rails.

I beg to inform the railway public, that the machinery for testing the strength of axles, and the strength and soundness of the tyres, is now ready; and I offer it to the public without any charge for its use, to try any one's make of axles and tyres they may think proper. A machine has been designed, and is now making by Messrs. Fox, Henderson, and Co., for proving the quality and durability of tyres and rails by actual wear and tear, the same as when at work on a railway, at any speed you like. The name of the designer is, I trust, a sufficient guarantee for its efficiency; in fact, it will be so true a test, that it must prove satisfactory to the most fastidious mind; and, so soon as it is completed, it shall be offered to the public, on the same terms as the testing machine above-mentioned.

Shrubbery Iron-Works, Wolverhampton.

G. B. THORNECROFT.

## THE IRON TRADE OF AMERICA.

The Mount Savage Iron-Works—the largest in America—are now purchased by a new company, and will soon be ready to recommence operations. These works were started by an English company, some 15 years ago, for the purpose of manufacturing iron on the largest scale. They consist of three blast-furnaces, amongst them the largest in the United States, the blast of which is carried by a steam-engine erected at a cost of \$72,000, a puddling-furnace and rolling-mill large enough to employ 600 men, a foundry, fire-brick yard, store, 320 houses for workmen, nine miles of H railroad, besides eight or ten miles of plate mine roads, a very large real estate at Mount Savage, Cumberland, comprising mines of iron and coal of various qualities, a superior clay for fire-brick, abundance of limestone, and building materials of all kinds. From the balance-sheets of the old company, it appears that the works and property have cost over the sum of \$1,600,000. The whole concern was sold to the new company for a little over \$200,000. This company are now busy making arrangements to open the establishment for work as soon as the price of railroad iron shall be such as to admit of successful competition with the English article. At present, they say, "the high price of labour in this country renders it impossible to compete with the English manufacturer, who, deprived of a market in Europe by the suspension of all works of internal improvement on the continent, sends all his stock to America."

The Mount Savage establishment, when in operation, employs nearly 4000 men, mostly foreigners. These men are so banded together among themselves, and with the workmen in other establishments, that they will remain idle, or work at another business for one-half what the company could afford to give them, rather than abate one cent. from their wages. Puddlers, for instance, who formerly received from \$3 to \$5 per ton, could now earn \$2 50 c. per ton, but prefer to work in the mines, or on the canal, for one-half the amount.

A pretty general complaint of the inferior quality of English railroad iron is getting abroad; and, in one instance lately, the Camden and Amboy Railroad Company have made a contract with a Jersey iron company for a quantity of rails at something over \$50 per ton, in preference to buying British iron at \$45. The English rails, it is said, are made of three qualities of iron, the best being upon the top, where the most wear comes. A short time after these rails have been used, this surface wears off, and the wear then comes upon the second layer, and in a little while the rails become so much worn that they are useless. While on this subject, I give the following extract from a Pennsylvania paper. It notices the fact that the Baltimore and Ohio Railroad Company have contracted in England for all the iron necessary to lay their track from Cumberland to the Ohio river, and says—"The contract price, we understand, is \$25 per ton, delivered, we believe, in Baltimore. From Cumberland to the Ohio river, the distance by the railroad is something upwards of 200 miles. Quantity of iron for the track, per mile, 94 tons—18,800, whole quantity; contract price, less duty, \$19 25 c.; add duty under tariff of 1842, \$25—\$44 25 c.; number of tons, 18,800; cost per ton, \$44 25 c.; cost of iron to make the whole road, \$831,524. It requires 7 tons of coal to make a ton of iron. Then 18,800 tons, by 7, would show 131,600 tons of coal required to make the whole quantity, at, say, \$1 12 cents. Then 81,600 tons; whole cost, \$137,392; cost of iron, \$831,524; cost of coal, \$137,392—\$968,916." In connection with this iron subject, it may perhaps interest some of your readers to hear of a new method of casting cannons, lately adopted at Pittsburgh. Instead of bringing them from the mould solid, and afterwards boring them, they are cast with the proper bore; the bore being carefully prepared so as to enclose a circle of cold water, which it receives and discharges in a continuous current during the process of cooling, the object probably being to chill the inner surface more rapidly than the outer, and thereby give it a greater density and strength. The plan is the suggestion of a Lieutenant Rodman; and two guns, one cast on the old, and the other on the new plan, having been subjected to the usual tests, the first exploded at the 84th round, and the latter at the 255th round.—Correspondent of the *Birmingham Journal*.

ABERDEEN RAILWAY.—Great delay has taken place in the opening of the line to Limpet Mill, within 12 miles of Aberdeen, from the refusal of the contractors to give up possession of the line, which was to have been opened for traffic on Tuesday. On that day, the directors, with their officers, endeavoured to take possession of the line by removing the contractors and their wagons; but the latter, with a large body of navvies, resisted, demanding to be paid for the work done upon the contract. On the following day, the sheriff and police authorities proceeded to the line, and had an interview with the directors and contractors. The terms of the contract agreed on were produced, and the payment to the contractors of 8000l. demanded; this not being complied with, a protest was taken against any further proceeding, and the sheriff granted an interdict.

LANCASHIRE AND YORKSHIRE RAILWAY.—The Railway Commissioners have authorised the opening of the Burnley branch of this railway, which is expected to take place in the course of a few days. This branch is nine miles in length, and connects the town of Burnley with the old Manchester and Leeds Railway. There are three tunnels and other heavy works on the new line.

GREAT SOUTHERN AND WESTERN RAILWAY.—The extension line of this railway to Cork was opened for public traffic on Monday.

CURIOUS MINING INCIDENT.—THE ARLEY COAL.—The miners who were employed in sinking to the Ince-hall Company's new Arley mine, of which we gave some particulars last week, in the course of their labours, while cutting through a white stone rock, 45 feet thick, opened a spring of salt water, which for a time threw up between 20 and 30 gallons per hour. The *Preston Chronicle* speculates as to the purposes for which this spring, the water of which was found exceedingly rich in mineral salts, might be available. Our contemporary will, however, find further conjecture on this point useless, as the spring, after gushing for some time, gradually diminished the quantity of its yield, and at length ceased altogether. It must, therefore, have flowed from some subterranean reservoir of impregnated water, containing but a limited quantity, and which it has completely drained. We may mention, while on this subject, that the Ince-hall mines are held by some four or five of the most influential of our Liverpool merchants—a class of gentlemen who are not less remarkable for the discretion than for the spirit and energy with which they pursue any enterprise or undertaking in which they may embark. It is the result of a wise and thoughtful system of action that operations, at first deemed speculative, have led to the successful issue lately notified by the public prints. The Arley coal, as was confidently anticipated, turns out to be of the finest quality. In every important requisite, particularly those of cleanliness, purity of combustion, and durability, it is, if not superior, at least equal to the best coal in the country. Of these facts the writer of this paragraph has had an opportunity of being convinced by ocular proof. As the operations for raising this fine coal are not yet complete, the Ince-hall Company will not be in a condition to deliver it in any quantity till towards the end of next year. When it comes fairly into consumption, however, it will be found of such a quality that those who love the comfort of a clean and bright fireside will be delighted with the radiance which it will shed over their domestic retreats.

USE OF COLOURED GLASSES TO ASSIST THE VIEW IN FOGS.—The following curious observation is made by M. Luvin, of Turin, in a letter to the editor of *L'Institut*, at Paris. If it be verified, it may prove to be of importance to geodetical operations, as well as in observations at sea:—"When there is a fog between two corresponding stations, so that the one station can with difficulty be seen from the other, if the observer passes a coloured glass between his eye and the eye-piece of his telescope, the effect of the fog is very sensibly diminished, so that frequently the signals from the other station can be very plainly perceived, when, without the coloured glass, the station itself could not be seen. The different colours do not all produce this effect in the same degree. The red seems the most proper for the experiment. Those who have good sight prefer the dark red, those who are short-sighted like light red better. The explanation of this effect seems to depend upon the fact that the white colour of the fog strikes too powerfully upon the organ of sight, especially if the glass have a somewhat large field. On the contrary, by placing a coloured glass between the eye of the observer and the eye-glass of the instrument, the intensity of the light is much diminished by the interception of a part of the rays; the observer's eye is less wearied, suffers less, and consequently distinguishes better the outlines of the object observed."—*Mechanics Magazine*.



COAL MINES IN PEMBROKESHIRE.—TO BE LET.

The machines can be made to order, of any size, at a proportionate price.

**JUCKE'S PATENT SMOKE-CONSUMING FURNACE.**

Edward Highton, C.E., telegraphic engineer to the London and North-Western railway, as to the plans and arrangements best suited for such purposes.

## FLUCTUATIONS IN THE STOCK AND SHARE MARKET

It will be observed that, notwithstanding the uncertainties on the Turkish question, which existed during several weeks, the range of Consols has not exceeded 1½ per cent. Railway shares, however, the fluctuations have even exceeded their ordinary force, the most violent instances being the Great Western, the North-Western, the South-Western, and the Midland, the range in the latter case being equal to upwards of 18 p. ct.—*Times*.

**CORNISH STEAM-ENGINES.**

Abstract from Browne's *Cornish Engine Reporter*, from Sept. 20 to October 23, 1849.]

umber reported .....	20
umber of kibbles drawn .....	65,681
verage depth of drawing, in fathoms.....	138·2
verage number of horse-whim kibbles drawn the average depth, by consuming	
wt. of coals .....	42·2

PUMP-ENGINES DOING HIGHEST DUTY.			
		Millions	
Consois	80-inch single	95.5	
rey Consois	80-inch single	98.1	
at Polgooth	80-inch single	88.5	
Consois	72 and 38-inch Sims's combined	84.6	
lawny	50-inch single	82.9	

at Consoles.....	22-inch double	21.7	W
Consoles.....	24-inch single	19.3	W
at Polgooth.....	22-inch double	16.8	W
<b>STAMPING-ENGINES.</b>			
at Polgooth.....	35-inch double	<i>Milions</i> 52.3	W
at Caradon.....	26-inch single	48.6	W

ONDAY.—Buddle's West Hartley 16—Carr's Hartley 16—Chester Main 16—East  
 air's Main 14 9—Hasting's Hartley 16—Holywell 16 6—North Percy Hartley 15 6—  
 16 9—Hotspur 16 6—Morrison 17 3—Percy 17—Riddell 17 3—Eden Main 17 6,  
 and 18—Lambton Primrose 17 9—Bell 17 9—Belmont 18—Braddyll 18 6—Hetton  
 Haswell 19—Lambton 16 6—Russell's Hetton 18 6—Stewart's 19—Washington 16 6  
 Hisswell 17 6—Hawthorn 17 13 and 12 4—17 13—

nd 17 3—South Hartlepool 17 6—Whitworth 15 9—Adelaide Tees 18 6—Brown's

15 3-14-Townley 15-Walkers Primrose 14-West Hartley 15 6-Westerton  
 15 12 3-14-Wylam 16-Wall's End Bewicke and Co. 17-Hilda 16 3-Northumber-  
 15 3-14-Percy 16 6-Eden Main 17 6-Belmont 18-Braddyll 18-Hetton 15 6-  
 15 18 9-Lumley 17-Lambton 18-Pemberton 17 3-Stuart's 18 6-Heugh Hall 17  
 Hartlepool 18 6-Kelloe 18-South Hartlepool 17 6 West Hetton 17-Whitworth 15 6  
 15 6-Cleanness's Tees 17-Tees 18 6-Anthracite 20-Anthracite Through and Through 16-

1990

COMPANY.  
15, OLD JEWRY CHAMBERS.  
TO BE INCORPORATED BY ACT OF PARLIAMENT.  
(Provisionally Registered, according to 7 and 8 Victoria, cap. 110.) 40  
Capital £100,000, in 20,000 shares, of £5 each, all paid up, with power to increase.

VICE-PRESIDENTS.  
JOHN BAGSHAW, Esq., M.P., Harwich.

The projectors of this company are now able to announce, that they have received the most unanimous support of the principal shipowners and others connected with the commerce of the port of London.

Those who desire, on principles of philanthropy, to further this great national undertaking, may do so by donations to a fund to be set apart for the equipment of the life-boat service—a statement of which will be annually published.

PROSPECTUS

With a view to secure efficient officers and men, it is proposed that the masters and first mates shall be selected from the Cleopatra Boats and Tugboat Pilots: the crews from the

is undertaking has been submitted to the Right Honourable the Lords of the Admiralty, from whom a communication has been received, expressing the satisfaction their Lordships feel in knowing the company's vessels will be so constructed as to render them available for purposes of defence in cases of emergency; and there can be little doubt, viewed as a nationally beneficial undertaking, their Lordships will recommend her

from the date thereof; further information may be obtained at the office, on per-application.

Figure 1. A schematic diagram of the experimental setup. The subject is seated in a chair, viewing a video screen. The screen displays a target (a small circle) and a starting point (a larger circle). The subject's hand is positioned at the starting point, and the video screen shows the hand's position relative to the target. The subject is instructed to move the hand to the target. The video screen is controlled by a computer, which records the hand's position and the time taken to reach the target.

**RICKFORD'S PATENT SAFETY FUSE.**—The Patentees

In 1949, if it then becomes a claim	£1187	4	0
1850	1209	12	0
1851	1232	0	0
1852	1254	8	0

TABLE.—*Illustrating Accumulation of Additions on £1000 Policy on Society's Plan :—*

THE WHOLE PROFITS DIVIDED AMONG THE ASSURED.  
 Manager—WILLIAM SPENS.

Resident Secretary in London—J. E. C. KOCH.

JOHN BENNET, Esq.	GEORGE HELMORE, Esq.
THOMAS BUNTING, Esq.	Sir WILLIAM OGILVIE, Bart.
ALEXANDER DAVIS, Esq.	FREDERICK A. PEEL, Esq.
JOHN KELLAND DURANT, Esq.	W. YATES PEEL, Esq.
AUGUSTUS COLLINGRIDGE, Esq., Managing Director.	

AUDITORS.  
Henry Rogers, Esq. | Henry Woods, Esq.

to the society, at, Cornwall, London; or as the offices or the agents to the society.

**Local Agencies are formed in Wales, Cornwall, and in the principal Towns of the United Kingdom.**

Persons desirous of being appointed agents are requested to apply personally, or by

to the managing director, AUG. COLLINGRIDGE.

In the advertisement of this assurance company, on the 6th inst. we inaccurately

In the advertisement of this insurance company, on the 6th inst., we incorrectly used the name of Mr. Matthew French Wagstaffe, as one of the medical officers — he has, previously requested by the actuary to omit it. — Ed. M. F.

MOVABLE LIFTING JACKS,  
MANUFACTURED BY  
J. GALLOWAY

AND J. GALLOWAY,

respectfully requested to the superintendent of those annexed, over those hitherto in use.

Printed by BARNES, MIDDLTON, and published by HANLEY LEONARD (the proprietors), at their offices, No. 26, FLEET-STREET, where all communications are requested to be addressed.

1940